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1984 WORLD'S SUBMARINE TELEPHONE CABLE SYSTEMS

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1984 WORLD'S SUBMARINE TELEPHONE CABLE SYSTEMS

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This compendium was prepared by Herbert H. Schenck and Dr. Leo Waldrick of Underseas Cable Engineers, Inc. under contract to, in support of, and funded by the Office of International Affairs, National Telecommunications and Information Administration

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Repeater Away!

As a seacable system is installed the cable is paid out at the stern of the cableship. The submerged electronic devices, repeaters or regenerators, spliced into the cable at intervals, are sequentially discharged with the cable.

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FOREWORD

Inception

Although many listings of submarine telephone cable systems existed prior to 1975, none was sufficiently extensive nor authoritative to serve as a reference work for those interested in the role of submarine telephone cables in the world's telecommunication network. Consequently the United States Department of Commerce sponsored the publication in 1975 of World's Submarine Telephone Cable Systems.

Criteria for Inclusion

Inclusion of a seacable system project in the first two editions required that the cable system make use of submerged electronic amplifiers (repeaters).

Underwater cables (of course without repeaters) were used in the late 1800s for extending telephone service to off-shore islands and across bays and estuaries. These were adaptations of land cables and were electrically akin, using dedicated pairs of copper conductors for transmission of the telephone signals. Later, in the 1920s advances in electronics enabled the range of off-shore service to be extended, by the use of repeaters at the shore terminal points. Further improvements made use of coaxial cable construction, a center copper wire surrounded by insulating material and encased in a copper outer conductor, strengthened by steel armor wires on the outside, with the application of carrier-frequency multiplexing techniques as developed for land systems, resulting in the capability to accommodate more than one telephone circuit, a notable example being the cables from Key West, Florida to Havana, Cuba, a distance of about 90 miles. There the march of technology paused.

Though amplification and carrier-frequency applications on land systems permitted mulit-circuit service to span thousands of miles, the adaptation of these procedures to long trans-oceanic cable work was inhibited by the lack of trustworthy long-life thermionic vacuum tubes and reliably-impervious enclosures to permit the electronic units to be installed in the submerged cable at regular intervals, necessary for the requirements of satisfactory telephonic transmission. The break-through, not dramatic but gradual, occurred concurrently in the United States, the United Kingdom, and in Europe, where development of trustworthy vacuum tubes was taking place, and in 1943 an amplifier designed and constructed by the then-British Post Office laboratories was inserted in a previously-laid 44-mile coaxial telephone cable between Holyhead, Wales and Port Erin on the Isle of Man, improving the capabilities of that facility from 24 to 48 simultaneously-operating circuits.

From that point onward, development was steady, and led to an important milestone event of this century, the installation of the first trans-atlantic telephone cable system in 1956. At that time no less than 24 other undersea telephone cable projects using submerged repeaters had been successfully installed.

As mentioned, there was (and is) a plethora of underwater telephone cables without submerged repeaters, so numerous that if listed would tend to mask the importance of systems of sufficient significance to require repeaters. Thus the threshold for a project's inclusion in World's Submarine Telephone Cable Systems was established to exclude the hundreds of cables not requiring submerged electronics.

The first edition of this work omitted mention of projects that were no longer in use as of the end of 1974, leaving some tantalizing gaps in the history of the submarine telephone cable art. This exclusion was removed for the second edition (1980) so that all known systems of consequence were chronicled, including even experimental systems, many of which reflect important bench-marks in the history of development. This present edition continues to describe all known projects, allowing even the mention of experiments in the open sea not touching land at any point (except the sea-bottom!), of which there have been several, heralding the arrival of the fiber-optic revolution. Of such importance is this revolution, an exception has been made to the rule of exclusion, allowing mention of some experimental fiber-optic systems deployed in the sea without repeaters.

The first edition (1975) contained discussion of many aspects of the submarine cable industry with illustrations. The second edition (1980) contained an expanded commentary and more illustrations. It has been the intent in this present edition to amplify the discussion of the most striking development in the submarine cable industry--the use of the fiber-optic mode for transoceanic service.

Analog and Digital

In the mid-1970s successful commercial utilization of the technique variously called light-guide, light-wave, or fiber-optic, which allowed the transmission of intelligence by means of pulses of light carried by optically-suitable glass fibers, became a reality. Of course studies to adapt this new technology to long undersea cables were initiated in the laboratories of the traditional submarine telephone cable makers and the principal users.

Until that time, all submarine telephone cable systems utilized frequency-division-multiplex techniques for obtaining multi-channel operation in coaxial cables. The electrical signals were analogous to the acoustic properties of human speech, message telephone service being the primary purpose of the international submarine telephone cable systems.

The advent of the fiber-optic mode of transmission brought the desirability if not the necessity for digitization of the transmissions, whereby the acoustic waves of the telephone user's voice were first changed into analogous electric currents, and then converted to the digital mode, so that the instantaneous value of an analog electrical signal becomes converted to a coded stream of successive pulses, each pulse having one or the other of only two conditions: on, or off. This, when used in the optical mode, becomes--light, or no light.

Much more discussion of this will be found in the section dealing with fiber optics. Suffice it to say here that henceforward we must distinguish between all submarine telephone cable systems in commercial service today, all of which are analog systems, and those of the future, some of which may still use the traditional analog mode and with the rest to be digital, operating in the optical mode.

Information Contained

Detailed data profiles are given for all systems known to have been placed into service through the end of 1983. For those projects due for completion in 1984, there are descriptions containing as much information as is available in mid-1984. Finally the status--insofar as is known--of other projects: those pending, deferred, and indefinite, is given. As before, there is a listing of system-owning entities, mostly governmental but some investor-owned, and manufacturers and system construction contractors are listed. Also as before, there are maps showing the general cable situation in areas of the world's oceans and seas, a glossary, and a bibliography. An appendix lists all cableships of consequence since 1900 with dates of commissioning and retirement.

* * * * *

As for the previous editions, this volume could not be satisfactorily completed without the kind coöperation and assistance of numerous officers in the owning entities and in the manufacturing and contracting community. To those who helped, grateful acknowledgement is hereby warmly given.

Herbert H. Schenck
Washington, D. C.
October 1984

SUBMARINE TELEPHONE CABLE SYSTEMS

Modes: Terrestrial and Spatial

Two modes for intercontinental telecommunication exist: the terrestrial, and the spatial. The relative merits and costs of these modes were still being widely debated in 1980, but in the most recent years, the astounding capabilities expected of submarine cables operating in the optical or light-wave mode, will soon be realized. However, it is not the purpose of this publication to join the debate but to describe the terrestrial mode, the submarine cable--and to explain what it does, how it does it, and how it is created, mobilized, deployed, and used. We shall chronicle the developments of the world-wide submarine telephone cable network of today, and present a compendium of data covering the cable systems that have been installed.

Precursors

It is generally known that the steamship GREAT EASTERN with Mr. Cyrus W. Field and Dr. William Thomson (who later became Lord Kelvin) aboard, at last successfully laid a telegraph cable across the Atlantic from Ireland to Newfoundland in 1866, nine years after their first abortive attempt. It is also generally known that the "electric telegraph" as it was called, had been in overland use in Europe and America since early in the 19th century, credited by Americans to Samuel Morse and in Europe to other contemporary inventors.

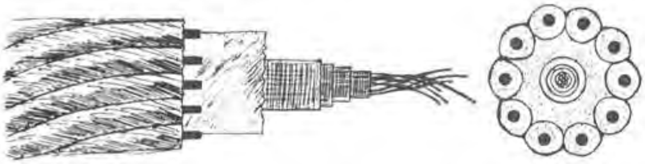
In the ensuing 90 years after the first success, telegraph cables spanned every ocean to bring communication to every place of civilization and commerce. In the course of those 90 years, there were many technical triumphs--development of duplex operation, inductive loading, and signal regeneration. It is curious that today, after the last telegraph cable has been retired, the principle of signal regeneration is the heart of the new triumph in oceanic telecommunication--the fiber-optic submarine telephone cable.

In simple terms, duplex operation utilized electrical circuit principals enabling the simultaneous flow of information in both directions through a single facility. Inductive loading permitted an increase in the speed of the flow of information in a cable, and signal regeneration allowed the transmission of intelligible signals over distances initially impossible, by the successive reconstruction of the signals from their deteriorated condition as a result of attenuation and distortion.

The early submarine telegraph cable systems consisted of a single-wire direct-current earth-return circuit using a stranded copper con ductor sheathed with an insulant, predominantly the organic resin gutta percha. The cable was strengthened with external steel wires to prevent it from parting when laid or recovered in deep water, and with additional steel wires ap-

Steamship GREAT EASTERN, then by far the largest ship ever constructed, was converted from her original configuration as a passenger liner to a cable-laying ship and used for attempts to place a telegraph cable between Ireland and Newfoundland. The first success in 1859 was short-lived, the cable failing after only a few weeks in operation. An attempt later, in 1866, resulted in a completely-successful link that operated for many years.

plied for the shallow-water portion to resist rupture when snagged by anchors and trawls, and to retard abrasion. The deep-water portion of the 1866 transatlantic is shown. Its outside diameter was about 1.1 inch.



Sketch of the structure of the 1866 transatlantic telegraph cable. The conductor consisted of stranded copper; it was sheathed in several applications of gutta-percha which were then surrounded with hemp. Over this, helically wound, were steel wires covered with hemp and saturated with tar.

Radio versus Wire

Submarine cable telegraphy was challenged by radio telegraphy in the early 1900s and despite predictions from both quarters that one would drive the other out of business, both prospered side by side. Only in recent years was the last submarine telegraph cable abandoned, and international radiotelegraphy in its many forms is still in surprisingly-widespread use.

Of course technology advances in radio provided the ability to make telephone transmissions, and for the 30 years following 1927 the world's overseas telephone service was carried almost entirely by radio. Meanwhile telephony by submarine cable, at first limited to short distances, came into broader usefulness with the development and installation of a submerged amplifier (repeater) in 1943, the success of the first deep-water repeatered system in 1950, and the first transatlantic telephone cable system in 1956.

Carrier-Frequency Telephone Cables

Multichannel carrier-frequency coaxial telephone cables came into use on land in the late 1920s; before long, use was made of this technique for submarine cables for short distances not requiring intermediate electronic amplification. A notable extreme example was the installation of frequency-division-multiplex coaxial cable systems under the 90 miles of deep water between Key West and Havana in the 1930s

"Frequency-division-multiplex" is synonymous with"analog", as currently used to distinguish between analog and digital transmission.

Repeaters

The fundamental requisite for long distance multichannel telephonic transmission by coaxial cable (the analog mode) is the provision of recurrent steps of amplification along the cable. The cable attenuation rises roughly with the square root of frequency, and attenuation is a direct function of cable length. It is obvious that increments of amplifier gain must be successively introduced in long systems to compensate for cable loss so that workable relationships between loss and gain, signal power levels, amplifier noise thresholds, and other factors, are obtained.

Since submarine cable repeaters are not, to say the least, readily accessible lying on the bottom of the ocean, their ability to function continuously for many years is imperative. The initial success of transoceanic telephone cable systems hinged on the availability of long-life electronic components, particularly vacuum tubes. Lengthy and costly development in America and Europe resulted in highly-reliable tubes--"trustworthy valves". Later, reliance fell upon trustworthy transistors, of which there was satisfactory production in England, France, and Japan, as well as in the United States.

Early Cables

The insulant employed for the old telegraph cables was gutta-percha, a natural resin, later improved by compounding with organic rubber to be called para-gutta. Thus, when carrier-frequency submarine cables were initiated, mostly para-gutta was used. An historic discovery in the chemistry of synthetic insulants occurred in England, resulting in the polymeric resin called polythene.

Wheras gutta-percha was vulnerable to marine biologic attack, polyethylene (to use the American name) appears to be immune to degradation in sea water. Therefore all analog submarine telephone cable systems were designed around the use of polyethylene.

Early Submerged Repeaters

It should be noted that a telegraphic regenerative repeater was installed in one of the transatlantic cables in the 1930s, resulting in increased signalling speed. However, at the time, more serious attention was being given to the development of analog amplifiers for submerged service for frequency-division-multiplex telephone cable systems, and the submerged telegraph regenerator never came into extensive use. It is an interesting commentary that regeneration of digitized signals in the form of light pulses is the heart of the fiber-optic revolution more than 50 years after the first submarine telegraph regenerator was installed.

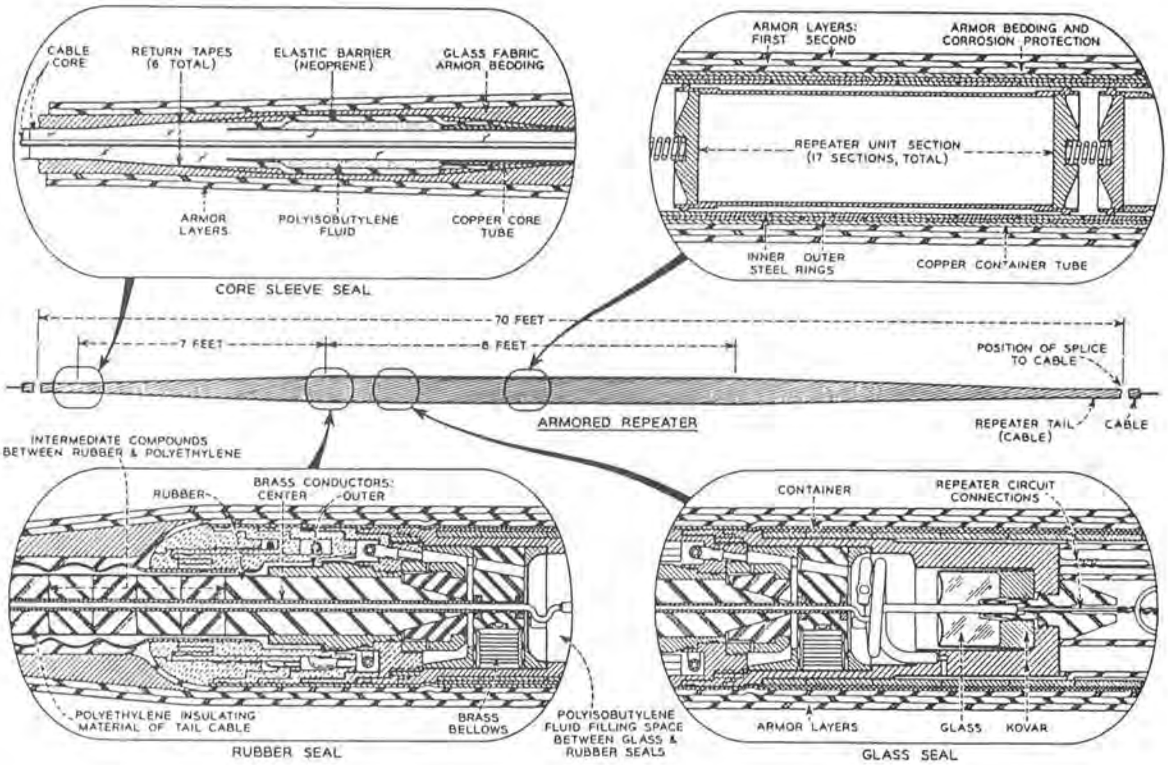
The first use of a submerged telephone repeater (analog, of course) was in 1943 and involved the insertion of a repeater near the midpoint of a previously-laid 44-mile submarine coaxial carrier cable between Anglesey and Port Erin in the Irish Sea, thereby raising the usable upper limit of the transmission band from about 250 to over 500 kHz, permitting the doubling of the number of circuits, from 24 to 48.

Three philosophies regarding repeater configuration grew side-by-side. In Britain it was preferred to re-equip cable-laying ships with replacement cable payout engines that would allow the British repeater, a long rigid cylinder without gimbals for the cable attachment, to be by-passed alongside the engine, as seen here. The cable normally was controlled by friction as it passed over and under a line of five large grooved wheels. When a repeater was to be discharged, a by-pass rope was led into the engine and tautened, thereby giving slack in the bight of cable which was then diverted, and the repeater trundled past the engine. In America and in France and Germany, different designs emerged.

Early Cable Laying

The 1943 repeater housing was not designed to withstand much more than the moderate pressure at the depth of about 17 fathoms, nor was it suitable for pre-insertion in a cable for overboarding along with the cable as part of the cable laying operation. This latter restraint was under attack, however, and by 1950 a repeater enclosure suitable for deployment with the cable as a practically-continous but seemingly awkward procedure, was produced and used by British interests.

The awkwardness stemmed from the physical characteristics of the enclosure, a cylindrical steel casing less than a foot in diameter and about 9 feet long, with almost inflexible cable attachments at the ends as seen in the illustration. No pre-1950 cableship, of which there were many, could satisfactorily pay out cable with such objects spliced into it. Therefore a new mechanism for controlling the laying of cable was devised with a means for by-passing the repeater around the line of sheaves, over and under which the cable ran during payout. This eliminated the necessity to stop the ship entirely, which is undesirable during cable laying, but it did require a reduction in speed whenever a repeater was to be overboarded. Later developments in cableship machinery allow the discharge of a repeater without alteration of ship's speed.



In the late 1940s plans for transatlantic No. 1 were advancing, and AT&T decided to configure their repeater so as to be satisfactorily paid out by cableships with the then-current payout engine design, a large drum-style winch on a horizontal thwartships axis, located at the aftership. The design, as seen here, is a very long string of articulated capsules all covered by the cable's armor wires, behaving as though it were part of the cable, although somewhat fatter and stiffer. Space inside the capsules was insufficient to accommodate components for directional filters and thus the system design called for twin coaxial cables, one for each direction of transmission. The prototype system, designated SA, was placed between Key West and Havana in 1950, system reference number 5. Transatlantic No. 1, an SB system having greater circuit capacity, system reference number 30, was laid in 1956.

Transatlantic No. 1

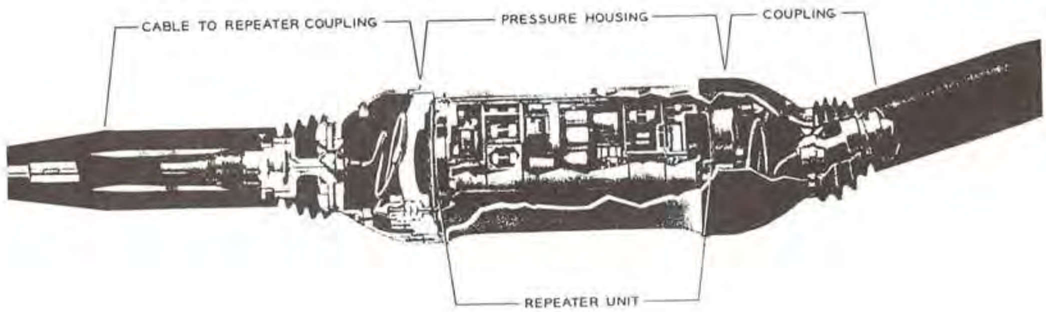
Well before the prototype Key West - Havana system was installed, British, Canadian, and U. S. interests were planning for the first transatlantic telephone cable attempt. The story of TAT 1 has been told often, and its success in 1956 gave the impetus to the telecommunications industry to proceed to lace the oceans with submarine telephone cable systems, totalling by 1984 approximately 250 projects, connecting over 60 countries, representing investment of nearly five billion dollars.

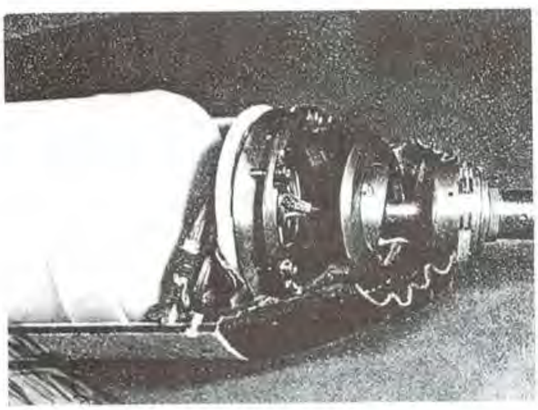
France, Germany, and Japan

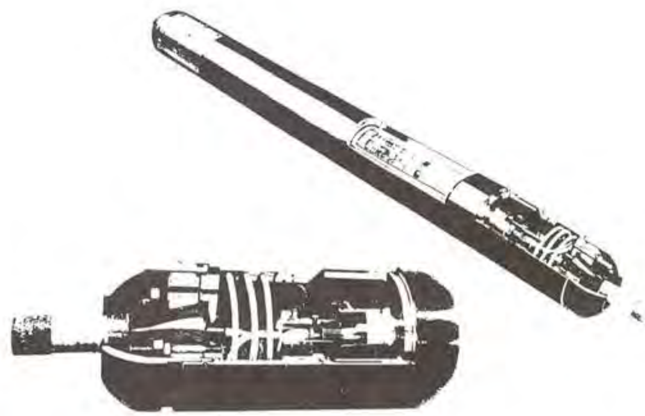
Paralleling the developments in Britain and the U.S., work was underway in France and Germany, related first to shallow-water projects, with later designs suitable for any ocean depth. Meanwhile, in Britain the long rigid repeater enclosure was modified for deep water use.

The British concept of bi-directional repeaters, permitting full-duplex operation on a single coaxial, was followed initially by the German and French developers, adopted in the early 1960s by

AT&T, and by the Japanese industry in their first designs in 1970. From that late beginning Japan has progressed to be fully competitive in all aspects of submarine cable technology.







In France and Germany designers also favored some means to allow repeaters to be laid by conventional cableship machinery. After Felten & Guilleaume in Germany and Compagnie Industrielle de Télécommunications in France had produced multicontainer designs, articulated strings of capsules but larger in diameter than the SB repeater of AT&T, each group produced monocontainer designs with short, fat dimensions, about 3 feet long by about a foot in diameter, with flexible cable attachments by gimbals. By the time AT&T produced their second generation design, the SD, they had dropped the unidirectional characteristic of the SB and adopted the monocontainer with gimbals. Seen here, not to scale, are, from the top, Japanese and U. S. repeaters, and below left, a cut-away view of the cable attachment arrangement of the French repeater, and cut-aways of the British design.

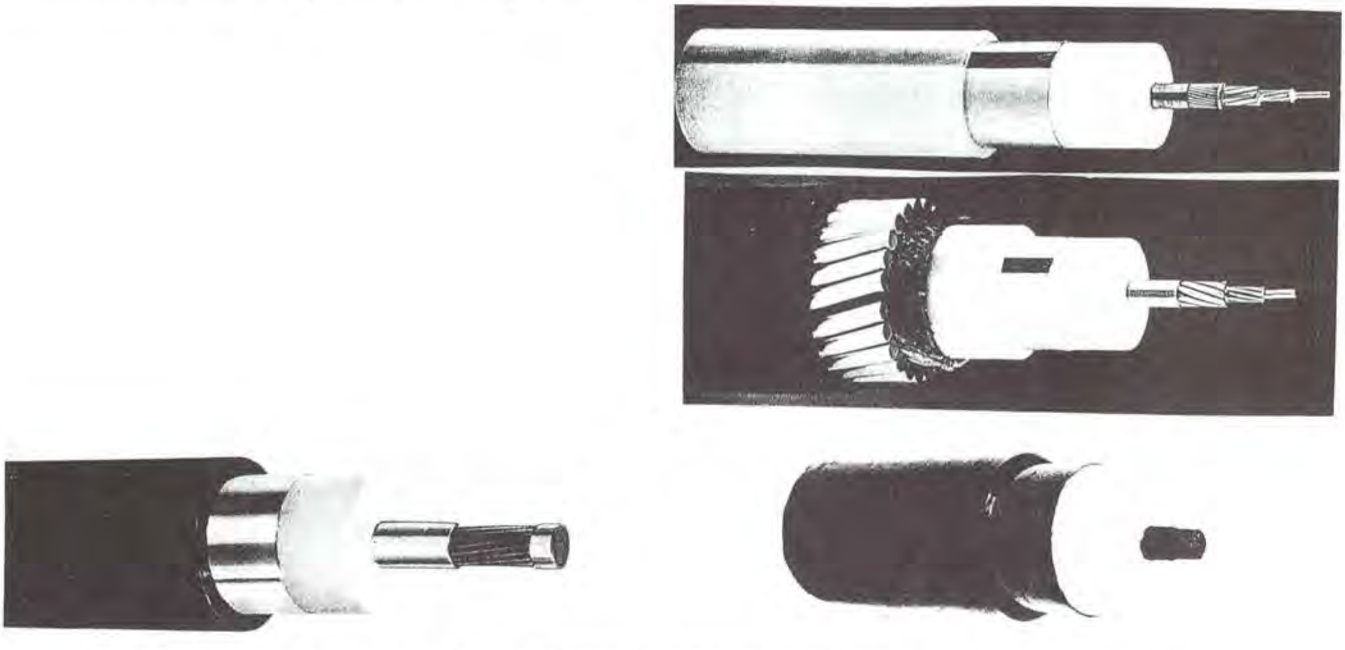
New Cables

The new art of transocean cable telephony that blossomed in the decade of the 1950s required not only the development of the submerged repeater but also new cable designs. Old telegraph cable configurations were not satisfactory for the elevated frequencies required for multi-channel carrier telephony, which need optimized coaxials with homogeneous dielectric materials. Some very sophisticated compromises were made, and thanks to the fortuitous properties of polyethylene, the result, the then-called conventional armored cable was an unqualified success that has seen over 50,000 miles laid in the oceans.

Cable destined for the ocean depths had to have sufficient tensile strength so that the weight in water of a length of cable equal to the distance from the surface to the bottom will not exceed the cable's breaking strength. In the conventional cable design used for TAT 1, the SB, this strength was supplied by helically-applied steel armor wires, 24 high-tensile, 0.086-inch-diameter strands being used.

Thirty years ago this was the situation: systems for transocean service of only 36-channel capability, shallow-water systems of only 60-channel size, some repeaters dischargeable from conventionally-equipped cableships; some requiring special cable machinery not previously used on cableships.

But even while the designs for TAT 1 were crystallizing, engineers on both sides of the Atlantic were busy with ideas for improvements. Cable with steel armor on the outside has some inherent disadvantages: it twists when tensioned, it may be difficult to coil down during recovery, and the steel is sooner or later likely to be exposed to sea water. The designers' answer in the late 1950s was a new configuration called lightweight or armorless. This cable represented a number of departures: there was a steel strength member at the very heart of the cable, surrounded by a copper sheath forming the coaxial inner member, insulated with an extrusion of ployethylene to a diameter of about 1 inch, encased in a copper or aluminum sheath forming the outer conductor, and the whole then jacketed with a covering of high-density abrasion-resistant polyethylene. This configuration has been used, in increasingly larger diameters, in all of the analog systems installed to the present day. And in the twilight of the analog era, the basics of the armorless design are being followed in the configurations emerging in the new fiber-optic cables.



There has been only one significant change in submarine telephone cable configuration: from the so-called conventional armored design such as the SB style shown at top left to the lightweight or armorless designs. Below the SB is the first British lightweight design with 0.99-inch dielectric, and next the French armorless configuration at 1.00 inch, produced to the AT&T SD specification. Larger sizes are represented on the right (obviously not to scale): top, British 1.47-inch lightweight, and 1.47-inch cable with external armor for hazardous locations. At bottom right is the AT&T armorless 1.7-inch SG design. The SF, not shown, had 1.5 inches over the dielectric, and was similar in all respects.

History Resumed

In the period just following 1956 the improvement in user satisfaction of the TAT 1 system over the previous radiotelephone services resulted in greater-than-anticipated traffic growth. So, without waiting for the second-generation of improved designs,TAT 2, as an SB system, was rushed into being in 1959, followed closely by the Britain - Canada system called CANTAT, in 1961.

While TAT 2 was a close copy of TAT 1, CANTAT was all new, representing the latest British developments such as the lightweight cable, deep-water bi-directional repeaters for 60 circuits, plus a further British development providing 120-circuit repeaters for the 400-mile portion called CANTAT B between Grosses Roches, Quebec and Corner Brook, Newfoundland, executed as a separate project.

By this time a new American system labeled SD was nearing readiness. Just as the British designers had done, the U.S. cable configuration had the strength member on the inside. Also, the SD system used a repeater housing quite different from the SB, the articulated one-way repeater requiring twin cables for a single system. SD used a monocontainer style with cable attachments by gimbals at the end, resulting in an effective flexibility which allowed a repeater to be passed around a conventional cable engine's drum.

* * * * *

Although attention has been leveled thus far on British and U.S. activities, developments in Germany and France had not stood still. In 1956 the French industry placed a 59-mile 120-circuit system in the Mediterranean between two Tunisian points, Qelibia and Bou Ficha, using cable very much like the SB, and in 1957 a trans-Mediterranean system between Marseille and Algiers was installed. In 1957 and 1958 some short 120-circuit systems were placed in shallow waters around the British Isles, and a German-built 120-circuit link appeared in a system between Denmark and Poland in 1960. In 1962 a second French system crossed the Mediterranean. The French and German repeaters were the pioneer monocontainer types, having flexible cable attachment at the ends, which was followed, as noted, by the American SD , and later by the Japanese industry.

In the following table the typical cable styles that have dominated the analog era are given. The Generic Type indicates the style of the coaxial and Code refers to the nature of the armor as expressed by the manufacturers and principal users. In cases of SB cable, Code D indicates the configuration used for the deep-water portion of a system. For SD, SF, and SG, L1 is the code for deep water, indicating no external armor. Diameters are in inches and weights are in long tons.

TYPICAL CABLE CHARACTERISTICS

Generic Type	Code	Insulant Diameter	Outside Diameter	Long tons per NM in air	Long tons per NM in sea-water	Breaking Strength lbs x 1000	Cu. ft. per N.M.
SB	LPAA	0.620	3.20	40.8	30.2	180	512
SB	AA	0.620	2.67	26.9	19.0	130	356
SB	A	0.620	1.83	11.1	7.6	167	167
SB	D	0.620	1.25	3.5	1.7	25	78
SD	L5A	1.00	3.50	40.0	31.0	169	612
SD	L4A	1.00	2.72	19.7	14.3	71	370
SD	L3A	1.00	2.21	14.3	9.6	56	244
SD	L1	1.00	1.25	2.0	0.9	17	78
BLW	Mk II	0.99	1.25	2.0	0.58	17	78
SF	L1	1.50	1.75	3.8	0.89	17	153
SG	L1	1.70	2.08	5.7	1.6	37	216

Cable Makers

Of the many hundreds of manufacturers of electrical wire and cable, only a handful have ever essayed the production of cable suitable for submarine telecommunications use. In Great Britain the many manufacturers of the telegraph cable era were consolidated finally in Submarine Cables Limited, in turn taken over by Standard Telephones and Cables Limited in 1970, today the sole producers of submarine cable in the U.K.

In the United States, throughout the telegraph cable era, only Simplex Wire and Cable Company, then of Cambridge, Massachusetts produced this commodity. Then when AT&T designed their lightweight SD cable, a plant in Baltimore was set up by Western Electric to make it.

AT&T encouraged others to prepare to produce this design, which called for considerable modifications to existing manufacturing facilities, and while Simplex and Submarine Cables declined, Norddeutsche Seekabelwerke, Les Cables de Lyon, and Ocean Cable Company all subscribed to the specifications and prepared to produce SD.

About this time the Western Electric plant in Baltimore was shut down and the machinery was acquired by ITT and set up in a new plant in San Diego in 1972. Only a very few substantial orders were forthcoming, however, and in 1977 the plant was closed and the machinery has become dispersed.

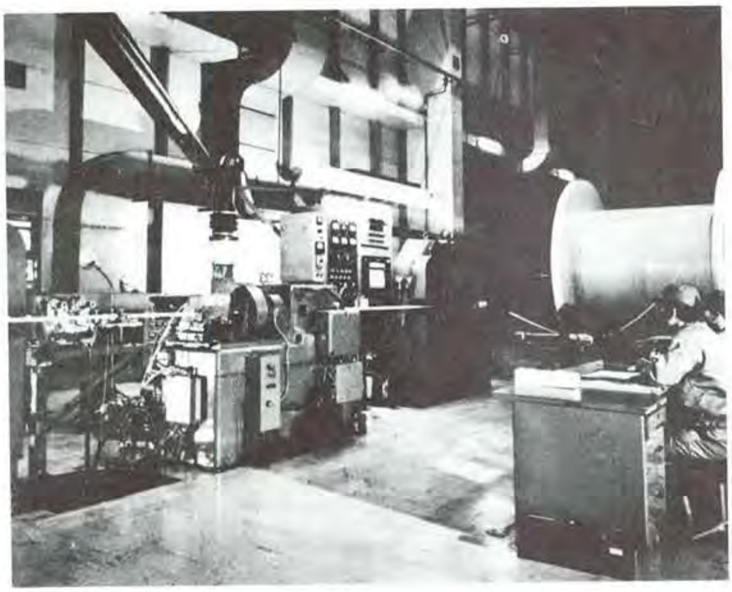
Norddeutsche Seekabelwerke similarly did not receive sufficient orders to sustain their new plant, and after several years of idleness, the machinery was acquired by Simplex and set up in their new plant at Newington, New Hampshire. Meanwhile Norddeutsche suffered a serious fire which destroyed their facility for conventional armored cable. Restored by the insurance underwriters, the plant has been mostly idle forever since. Norddeutsche did, however, produce several significant orders of cable for the analog cable era: Denmark - Poland, ICECAN, Grand Turk - Antigua.

In France, Les Cables de Lyon enjoys total eminence in the submarine cable field since its beginning, and until 1979, when by reciprocal agreement a British system joined France and England, no cable ever landed on French soil that was not produced by Les Cables de Lyon.

It does not tax the imagination that the island nation of Japan has had over the years an extensive and active submarine cable industry, producing all types of cable for inter-island service. But it was only after Ocean Cable Company established lightweight cable-making capability at Yokohama that production of cable suitable for submarine telephone cable systems has taken place.

Aerial view of the Simplex Wire and Cable Company plant at Newington, New Hampshire, with cableship NEPTUN(3), then the property of United States Underseas Cable Corporation, loading cable for a U.S. military project in Southeast Asia. Since then, Simplex has added an all-weather enclosure to the cable-loading facility so that operations are not impeded by accumulation of ice or snow. Also a new multi-million-dollar addition to the plant was dedicated in 1980 for the development and production of fiber-optic light-guide cable under contract to AT&T.

Aerial view of the cable plant of the then-named Standard Telephones and Cables PLC, recently re-designated STC Submarine Systems Ltd., at Berth 109, Western Docks, Southampton. Loading cable alongside is cableship MERCURY belonging to Cable and Wireless Ltd. STC and antecedents were pioneers in the dawn of the submarine telephone cable era, and have provided and installed more systems than any other entity.



Organized in the late 1960s by a consortium of several large electrical cable makers, Ocean Cable Company Limited's new plant for the production of coaxial submarine telephone cable was established in Yokohama. Under the patronage of Kokusai Denshin Denwa, Japan's international telecommunications carrier, and Nippon Telegraph and Telephone Public Corporation, the domestic carrier, OCC has produced thousands of miles of cable for scores of projects. Seen here is the control center for one of the automated lines for fabrication of the copper and steel center member of the armorless cable.

Still the largest-capacity cable-laying ship afloat, CABLE VENTURE, ex NEPTUN (3), is engaged in 1984 in placing the ANZCAN cable from Canada to Australia. Formerly the flagship of United States Underseas Cable Corporation, NEPTUN later served ITT Cable/Hydrospace Division before being sold to Cable and Wireless in 1975. Following refit and extensive modification, she was re-named CABLE VENTURE and in 1977 became the flagship of her new owner's fleet of six cableships.

Terminals, Repeaters, and Equalizers

Up until the present time all submarine telephone cable syetems have operated in the analog mode. They connect at their ends with electronic and power supply equipments which provide for the generation of pilot and carrier frequencies, and for frequency translation (modulation and demodulation). They also contain directional and power separation filters, equalizers, transmit and receive amplifiers, repeater monitoring facilities, and constant-current power supplies for energization of the repeaters.

Typically, traffic is fed to and from the inland network in the four-wire condition utilizing the CCIT supergroup allocations, with the same frequencies for both directions of transmission. At the cable terminals these bands are translated into two groups of frequencies, one positioned above the other so that full duplex operation is achieved with the single coaxial.

Analog repeaters have within themselves directional filters which allow, in some instances, both bands to be amplified by a single amplifier. They also contain power separation filters which divert the signal bands around the direct-current supply circuitry, and they contain fixed equalization. As discussed in detail in a further section, the advent of light-wave fiber-optic technology, with digital transmission, results in the substitution of digital regenerators for analog amplifiers, and many other mutations.

For both analog repeaters and digital regenerators the power feed is a constant direct current fed into the cable with earth return, and all the repeater amplifiers are energized in series, the value of the current being established usually below one-half Ampere. The repeaters' amplifier potential requirements are obtained from the voltage drop through each repeater, usually well below 50 Volts. Thus a hypothetical system with 100 repeaters might have a 5 kV drop from end to end, requiring a source of +2.5 kV at one end against earth, and -2.5 kV against earth at the other end. The supplies are duplicated and self-regulating with respect to line current, and arranged for no-break operation from floated batteries through inverters and rectifiers.

The Equalizer

Long analog cable systems with many repeaters are subject to cumulative effects which can be undesirable, and therefore equalizers must be employed. In an analog system the gain-frequency characteristic of a repeater is intended to exactly match the loss-frequency characteristic of the adjacent cable section. It might be thought that such characteristics could be predicted with sufficient accuracy to permit an exact match in repeater gain to be achieved. And if only one repeater were to be needed, the match between cable loss and repeater gain could be made easily within acceptable limits. But ocean systems have scores or even hundreds of repeaters in tandem and the cumulative mismatches must be dealt with by the insertion of passive circuitry at specified intervals, typically every 10 to 20 repeater sections. The equalizers are intended to compensate precisely for the difference between the forecast attenuation-versus-frequency characteristics and the characteristics actually measured during the progress of cable laying. The equalizer circuitry is sometimes assembled during cable laying, and inserted into an enclosure, to be welded shut shortly before discharge. In some other designs the circuitry may be switched electrically from outside a sealed enclosure just before overboarding, and in other instances, it may be controlled remotely through the system from the terminal stations. In yet other developments, the gain of certain repeaters is made self-adjusting in response to changes in the temperature of the surrounding water.

So much for analog systems. Digitized fiber optic systems do not require equalizers.

Supervision

It is necessary to be able to observe certain performance characteristics of each individual repeater or regenerator in a system, and provisions are made in the fundamental system design to allow for the examination of each unit's performance under command from the terminal station.

Sea-Proof Housings

Repeater and equalizer enclosures obviously must be designed for long submerged life at sea-bottom pressures. In general, the repeater or equalizer is encased in a composite high-tensile and stainless steel cylindrical capsule a little less than 3 feet long and about a foot in diameter and having knuckle-joints or gimbals at the ends to which the cable tensile member is attached. There is a moisture-proof electrical penetration at each end for the center conductor of the coaxial cable. In some instances the enclosures have been made of beryllium copper, notable for its resistance to attack by sea water.

Analog System Characteristics

Over the years there have been nearly thirty different analog submarine telephone cable system designs, with ever-increasing capacities for telecommunication service, employing cable and repeaters of various sizes and shapes. The table on the opposite page shows the principal characteristics of the analog systems, and the explanations of the captions are as here below:

Name

The most generally recognized designation for the system design; not necessarily the style of cable

Country

F	France
GB	Great Britain
J	Japan
FRG	Federal Republic of Germany
US	United States

Maker

ATT	American Telephone & Telegraph Company
BPO	British Post Office
CIT	Cie. Industrielle de Télécommunications
F&G	Felten & Guilleaume Carlswerk AG
FUJ	Fufitsu Ltd.
NEC	Nippon Electric Company Ltd.
NTTPC	Nippon Telegraph and Telephone Public Corporation
SCL	Submarine Cables Ltd.
STC	Standard Telephones and Cables Ltd.
USU	United States Underseas Cable Corporation

Size

A supergroup (of circuits) occupies 240 kHz of bandwidth in each direction, and can consist 60 individual circuits at 4 kHz spacing or 80 circuits at 3 kHz spacing.

Coaxial Size

The diameter in inches of the coaxial insulant

Nominal Repeater Spacing

The length of cable usually occurring between successive repeaters, in cable miles.

Repeater Style

A	Articulated, a string of cylindrical metallic enclosures joined by gimbals or a succession of cylinders arranged to flex as cable would, with tension carried by armor wires over the outside of the string.
M	Monocontainer, a single cylindrical metallic enclosure with cable attached through gimbals.
R	Rigid, a monocontainer without gimbals
UA	Unidirectional Articulated, a succession of cylinders arranged to flex as cable would, with tension carried by armor wires on the outside, of a diameter not much larger than the cable, and electrically unidirectional, requiring two cables to make a system.

Dawn of a new era. In 1979 this picture was prepared for an advertisement of Bell Laboratories in which it was to be revealed that an experimental glass fiber cable had been under test in a simulated ocean environment at the Holmdel, New Jersey facility of the Laboratories. Tests were at near 0° Celsius and 10,000 pounds per square inch pressure, corresponding to a depth of four miles in the sea. Simplex Wire and Cable Company made the first cable models as designed by Bell Labs.

CHARACTERISTICS OF THE PRINCIPAL ANALOG SYSTEMS

Name	Country	Maker	Year	Size, Super-groups	Nominal Coaxial Size	Nominal Repeater Spacing	Repeater Style
E Mark I	GB	BPO	1953	1	0.62	19	R
SB	US	ATT	1956	0.6	Twin 0.62	38	UA
Z 60 S	FRG	F&G	1956	1	0.62	22	A
French 60	F	CIT	1956	1	0.62	25	A
French 120	F	CIT	1956	2	0.62	14	M
M Mark I	GB	STC	1957	2	0.935 0.99	20	R
Z 120 S	FRG	F&G	1960	2	0.62	10	M
SD	US	ATT	1963	1.6	1.00	20	M
French SD	F	CIT	1966	1.6	1.00	20	M
T Mark I	GB	SCL	1967	8	0.935 0.99	7.5	R
SF	US	ATT	1968	9	1.50	10	M
U 120 S	US	USU	1969	2	1.00	17	M
NC	GB	STC	1969	8	0.99 1.47	7 10	R
CS 10 M	J	FUJ NEC	1969	15	0.70	3.3	M
S 1	F	CIT	1970	2	1.00 Cu A1	19 18	M
ND	GB	STC	1976	15	0.99	5	R
S 5	F	CIT	1970	8	1.00	9	M
NE	GB	STC	1971	23	1.47	6.5	R
CS 36 M	J	NTT	1971	45	1.50	2.6	M
CS 12 M	J	NTT	1972	20	1.50	6.5	M
S25	F	CIT	1975	43	1.50	5.0	M
SG	US	ATT	1976	50	1.70	5.1	M
NG	GB	BPO	1976	65	1.47 1.70	2.9 3.3	R
CS 140 M	J	NTT	1979	180	1.70	1.8	M

Electronic Manufacturing

Analog repeaters and equalizers are intended to function flawlessly for at least 20 years; some of the later designs targeted 25 years.

In pursuit of this level of reliability, the units were always fabricated under stringent clean-room conditions in plants dedicated solely to production of repeaters and equalizers, and nothing else. Though there may be scores or hundreds of organizations with the level of skill necessary for submerged repeater fabrication, very few repeater-making plants were ever established. Today's survivors are:

Standard Telephones and Cables Limited

Cie. Industrielle de Télécommunications

NEC Corporation (formerly Nippon Electric Co.)

Fujitsu Limited

Western Electric Company

Unlike repeaters and equalizers, terminal station apparatus is easily accessible for repair, and faulty operation in the station is a lesser catastrophe than a repeater fault. Nevertheless, the apparatus supplied for the terminal station requirements is of the highest obtainable order of quality, and practically all functions are duplicated. Again, there may be numerous firms capable of producing electronic equipment of the suitable level of excellence, but only those plants listed above as making repeaters are in the business of making terminal station equipment.

Left: The interior portion of a repeater is being inserted into the pressure-proof enclosure in the Felten & Guilleaume Carlswerk AG facility in Cologne. In the 1950s F & G arranged with French interests to develop thermionic vacuum tubes suitable for submerged repeaters, setting up Cie. Europeën des Tubes Téléphoniques near Grenoble. The products were acceptable, and both France and Germany launched submarine telephone cable enterprises. In 1965 the F & G facility in Cologne was acquired by United States Underseas Cable Corporation.

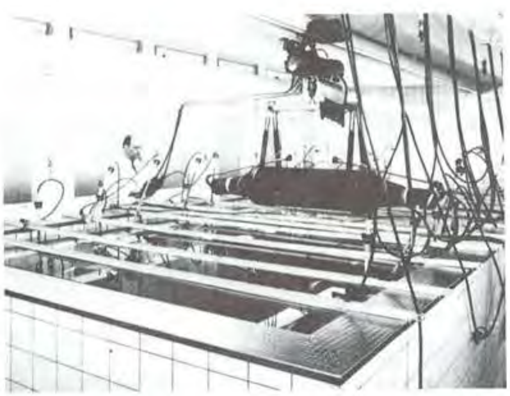
Right: The interior unit of a British repeater undergoes visual inspection. Two entities vied for dominance in the submarine telephone cable field: Submarine Cables Ltd. and Standard Telephones & Cables Ltd. In the end STC acquired SCL, and today STC continues the British traditions of innovation, excellence of product, and agressive marketing.

Testing Amplifier and Filter Assemblies

Assembling an Amplifier

Calibration of Components of a Repeater

Repeater in Pressure Housing Ready for Helium Leak Test at 750 Atmospheres



Repeater Prepared for 15-Day Submerged Confidence Test

Repeater Ready for Enclosure in Shipping Container

Growth Statistics

The growth in circuit capacity in slightly more than 30 years speaks elequently of the forward march of analog seacable technology. Bandwidths such as now are available allow for transmission of two or more television channels simultaneously with hundreds of message circuits, all in the analog mode. The digitized fiber-optic systems will be at least a quantum step beyond this.

A familiar unit of telecommunications statistics is the circuit-mile. The following table shows the status at selected years:

Year	Circuit-Miles in Operation
1960	600,000
1965	4,800,000
1970	14,700,000
1975	39,500,000
1980	91,900,000
1984	148,600,000

Currency instability tends to mask the significance of cost figures, and no attempt has been made to translate costs back to any particular epoch. System costs were taken as what they were at time of contract:

Year	Then-current U.S. Dollars
1960	180,000,000
1965	672,000,000
1970	1,077,000,000
1975	1,715,000,000
1980	2,977,000,000
1984	4,850,000,000

Investment per circuit-mile:

Year	Then-current U.S. Dollars
1960	300
1965	140
1970	73
1975	43
1980	32
1984	39

The reversal in trend may be attributable to inflation.

By contrast, the above figures, all representing analog systems, will seem to be very high, when, in 1988, TAT 8 is put into service. In its initial configuration with only 1890 circuits per fiber pair, it will encompass about 20 million circuit-miles. At a cost of $326 million, the circuit-mile quotient is about $17. In its fully-exploited condition, with 40,000 circuits per fiber pair, the cost will plummet to an astounding figure of less than a dollar per circuit-mile.

Life Expectancy

The earlier submarine telephone cable systems having submerged repeaters with vacuum tubes were built with a design objective of 20 years of useful service, it being acceptable that cable faults (from whatever cause) be found and cleared, and that submerged repeaters could be replaced, albeit at some considerable difficulty and expense. It is a vindication of the engineering and manufacturing arts that the 20-year useful life objective has been generously exceeded. Although some of the earlier systems have been retired, this has been brought about mostly by the paralleling of the old cables by newer ones of many times the circuit capacity.

As may be seen from the individual Seacable System Data Profiles, many systems are still in service after more than 20 years, and most of those retired served more than 20 years.

Even a hundred years ago when cable materials and manufacturing techniques were truly appalling by today's standards, a cable failure without some physical disturbance to cause it was agreeably rare. Then, as now, the interruptions were mainly caused by some human activity or to a lesser degree by some upheaval of nature or traceable to defects in workmanship or materials once the cable was successfully deployed.

All too frequently in the earlier days, and even to the present, important cables have been faulted by fishing trawls and dredges, ship's anchors, or other similar means. Fortunately it was feasible though not easy nor cheap, to find the fault, bring it to the cableship's foredeck, repair the damage, and restore the service. In this respect, things had not changed very much until recently: for some years now important cables are protected by placing them beneath the seafloor for a portion of the route, out to a depth beyond which it would be unlikely to encounter man-directed sea-bottom activity. Year by year this depth has had to be extended as off-shore activities have increased. Even so, it is still practical to consider that most of a cable's sea transit in deep water will be on undisturbed bottom.

The burial of seacable has become a common undertaking, and the techniques are quite refined. If the bottom is "plowable" the cable can be buried as laid, in a single pass by the cable-laying ship towing a plow astern.

Project Planning

The decision to construct a submarine telephone cable system will have been made on the basis of predicted traffic loads and on predicted capital and operating costs. These predictions are often made by the international telecommunications operating agencies of the countries to be joined, relying on the existing technical expertise within the organizations of the larger countries. In the instances of nations or entities with lesser internal technical establishments, the assistance of independent consulting engineering firms specializing in undersea cable technology is often useful. Planning, then, encompasses determination of what size system shall be placed between which coastal locations.

Project Sequence

Typically the project activity could be somewhat as follows:

- Correspondent countries or entities consider desirability of mutual ownership of a submarine telephone cable system
- Consideration may have been initiated by overtures from the manufacturing and contracting community
- The potential owners negotiate an agreement to build
- Potential owners select the entity that shall supervise project execution
- Project requirements as to system capacity and terminal locations are determined
- Detailed seacable system specifications are prepared and approved
- Invitations for tender are prepared and issued
- Tenders are received and evaluated
- Manufacturing and installation contract(s) are negotiated and awarded
- The system is manufactured and installed, tested, and accepted
- The system is commissioned for service.

Route Survey

It has been stated that there are very few coastal locations in the world that could not be the site of a submarine cable landing, but it goes without saying that some are vastly more desirable than others. It requires an engineering determination to take into account the numerous factors bearing on the desirability and cost for proper choice of possible cable landings. Some considerations, among many, are: geography of the coast line (bays, inlets, bars, shoals, reefs prevailing currents, swell, and surf conditions, depth contour, composition of the bottom, intensity and nature of surface traffic and underwater activity, relative distances and land goegraphy (roads, towns, streams, etc) with respect to possible terminal station locations, and the relation of these to the nodal points of the inland telecommunications network, the location of other cables already in the waters to be crossed, and so on and on.

The work leading to the choice of sites and route is divided into two activities: first, the route and site study, made by research into published charts, records, and other existing data, and then the route and site survey, made actually at the sites and over the route. The survey will produce near-shore depth contours and will record the results of examinations of the bottom by divers. If burial of some part of the cable is required, sub-bottom acoustic profiling will be done, cores taken, and reefs and ledges examined and charted. A trial pass with an empty plow may be performed in some instances. Several possible landing sites at each end are chosen and ranked in degree of desirability.

Concurrently with the shallow-water surveys several possible sites for the location of the terminal stations will have been examined and ranked in order of desirability. Then the two rosters of landings and station sites are compared and the best compromises are chosen for both ends of the system, to tentatively crystallize the landing points and the departure points for the deep-water portion of the route. The route survey voyage will then commence at one departure point and proceed to the other end.

For the route survey, a vessel suitable for safely steaming between the ends of the projected system is required, equipped to produce a bathymetric profile to a satisfactory degree of precision and to measure the temperature of the water at the sea-bottom at selected points along the route. Navigation aids will be used to the extent necessary to achieve the degree of precision required.

In the course of the route survey the depth profile will disclose the gradients of the bottom and formations such as trenches and seamounts. Any such anomalies of importance will be developed and charted, for decisions respecting avoidance of them in the chosen route. The recorded results of the route survey permit the final choice of the route, and they form an essential input for the system design.

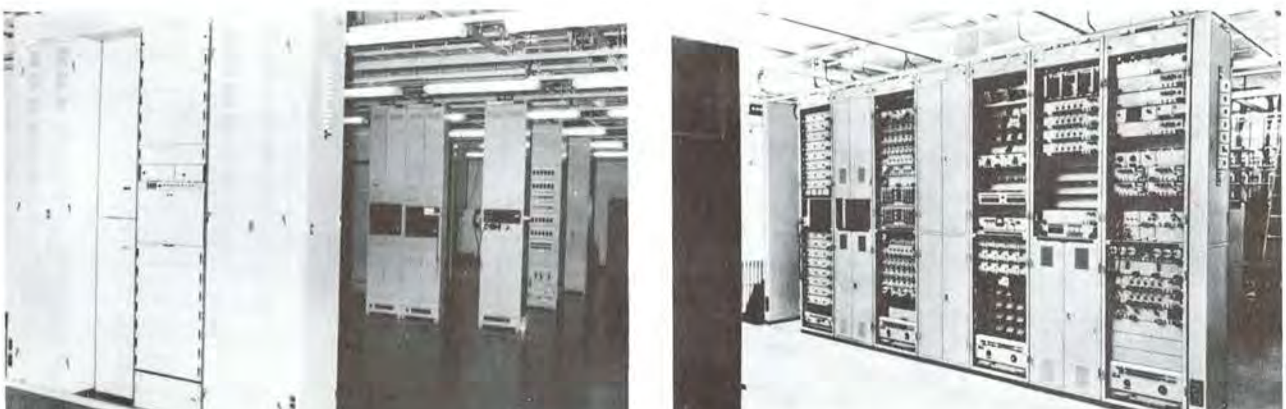
System Design

The system design encompasses determination of the size and characteristics of the cable and the repeater and equalizer spacing, in the case of analog systems. The route survey results will also allow for the definitization of the cable manufacturing order: the quantities of land cable required to reach from the water's edge to the terminal stations, and the quantities of cable having protective armoring. Shielding against radio-frequency intrusion is essential for analog systems, bearing in mind that the operating frequencies of analog systems do indeed lie in the MF, HF, and VHF radio regions, and the quantity of cable having radio-frequency shielding will also be definitized. Then the quantity of the main cable to be produced, and the precise lengths of repeater sections, will be determined. For fiber-optic projects regenerators instead of repeaters will be provided, and equalizers will not be required.

From the combined results of the route survey and the system design the cable-laying slack schedule may be established. Since it is desired that the cable lie un-stressed on the sea-bottom, an amount of cable in excess of the calculated absolute distance over the bottom is included and paid out. The amount of slack is an engineering determination and will vary for various portions of the route, relating to factors such as water depth and slope of the bottom.

KDD MARU anchored off shore at Chinen, Okinawa and paying out the shore end of the Guam - Okinawa portion of Transpacific No. 2. As the cable passes out of the ship over the bow sheaves, floats are attached to the cable at regular intervals with short rope pennants, the floats then keeping the cable a more or less fixed distance below the surface of the water and free of the bottom. When the shore end is properly affixed to an anchoring arrangement the cable is gently tautened to straighten out the line from ship to shore. Then when it is properly located, tension is slacked and divers cut free the floats, letting the cable settle into the desired position.

The terminal station building for the Integrated Joint Communication System cable at Camp McCauley, Taiwan, is typical of installations designed and constructed for military submarine telephone cable systems. The IJCS cable connecting Taiwan to Okinawa ceased to be required and was shut down in 1980.



In appearance, submarine telephone cable system terminal station equipment resembles conventional telecommunication equipment enclosures, racks, cable-ways, and cabinets. With the surge in system channel capacity in recent years, the multitude of circuit terminations--per-circuit items-- would have been burdensome except for miniaturization stemming from solid-state technology, integrated circuit items, circuit-card techniques, etc.

Project Execution

During the course of manufacture of cable and electronic equipment the terminal station buildings will have been prepared, and the completion of the manufacture of the terminal station apparatus may coincide with the readiness of the buildings. It is necessary that the terminal station equipment (at least at the starting end of the cable-laying operation) be installed and working before cable-laying begins. Also the land cable from the buildings to the shore must be in place, and, if required, the shallow-water portion of the cable from the beach to a point off shore will have been placed. If burial of the near-shore part is called for, this will have been done.

The cableship will have had all or part of the cable loaded aboard together with the associated repeaters (or regenerators) which will have been connected into the cable prior to the start of cable-laying.

If circumstances have not called for prior installation of the shore-end portion of the cable the cableship will be positioned at the departure point and will pay out the shore end with floats attached. The shore end will be drawn to the beach, its armor made fast to a beach anchor, and its signal-carrying portion joined to the land cable reaching to the terminal station. When this is done, there will be continuity from the terminal station to a cable end available on the ship, and tests will commence. The ship may then steam away on the course to pay out the cable on the pre-determined track.

Cable laying will proceed at the scheduled rate and repeaters (or regenerators) will be discharged without alteration of the ship's speed. A successful cable-laying voyage comes to a conclusion when the ship approaches the shore at the end of the lay and either joins the end of the cable to the previously-placed shore-end cable, or, in some cases, passes the shore end of the cable to the beach on floats. In either event, when the final splice is made, signal continuity should exist from terminal station to terminal station, and the end-to-end tests will insure that the system, which was continually under test during cable laying, is indeed still in satisfactory operating condition.

Traditional ceremony on the ship to commemorate the conclusion of a successful cable installation voyage. Here on the foredeck of cableship NEPTUN (3) the final splice of a military cable project for the U.S. Air Force, connecting the Philippines and Viet Nam, has been made and the bight of cable is held by a length of grappling rope seen leading to the right past the flag. When this rope is severed the cable bight will be released and will settle to the bottom. Air Force representatives and officials of United States Underseas Cable corporation, the system contractor, took part in the ceremony. The system was named WET WASH A (System reference No. 71).

Present and Future

Up until the present time the steady rise in the traffic-carrying capacity of submarine telephone cable systems has been permitted principally by improvements in trustworthy solid-state components and circuitry in the repeaters. Cable coaxial dimensions have increased, lowering the cable attenuation, and repeater intervals were shortened. In the instance of the British NG system operating at 46 MHz, the repeaters occur every 3.3 miles in 1.7-inch cable. A rough extrapolation would indicate that a 360-supergroup analog system would require a cable of nearly 4 inches over the dielectric for repeaters spaced at 3-mile intervals, or, with 3-inch cable, repeaters at 2.5-mile spacing. While these dimensions are extreme, they are not impossible, but thanks to the fiber-optic arrival, cable dimensions are radically reduced and the distance between submerged electronic units has been dramatically extended.

In the long and illustrious history of the analog systems, failure of electronic circuitry in the submerged repeaters was gratifyingly rare--almost non-existant, in fact. Now, in view of the awesome circuit capacities of the new fiber-optic systems, contemplation of a system interruption involving as many as 40,000 circuits (versus about 4,000 today) simultaneously out of service due to an electronic malfunction is unacceptable. Therefore for the first time we are observing the principle of circuit redundancy with remote-controlled switching being adopted as a design concept for the submerged units.

Ever since submarine cables have been employed, first for world-girdling telegraph services in the late 1880s, and for similarly-extensive telephone service since the 1950s, cables were subject to damage from man-initiated activity--from trawling for fish on the sea-bottom, or anchoring ships on the cable route, or dredging for shellfish, to name a few. As more circuit capacity developed in the telephone cables, from a handful (36 in two cables) to thousands in a single cable today, the costly but effective expedient of putting the cable out of harm's way--buried several feet deep in the seafloor, has been resorted to. The burial can be accomplished simultaneously with the initial laying of the cable or performed on previously-laid installations. Here is an underwater view of the first Bell System sea plow as employed by AT&T to sequester the coming-ashore ends of the transatlantic cables from the landing points out through the hazardous zones on the continental shelf.

Cableship LONG LINES, in many respects the world's largest cable-layer, is seen here passing a well-known landmark, Diamond Head, Oahu, Hawaii. Commissioned in 1963, LONG LINES has laid most of the submarine telephone cable systems that land in U.S. territory. Soon she will be elevated to the position of flagship of the AT&T cableship fleet, as SALERNUM, seen below, just recently acquired by AT&T to supplement the activities of LONG LINES, is undergoing refit and modifications at the Tracor Marine yard in Florida.

The Cableship

In the telegraph cable era, in the last century, cableships always started out as something else. Typical was GREAT EASTERN which was a passenger ship before becoming a cable-layer. Being the largest man-made article afloat, she was ideally suited for laying the first transatlantic telegraph cable over a hundred years ago. It was not until near the end of the last century that the unique requirements of cable laying plus the prosperity of the telegraph companies combined to produce a special breed of vessel: the cableship.

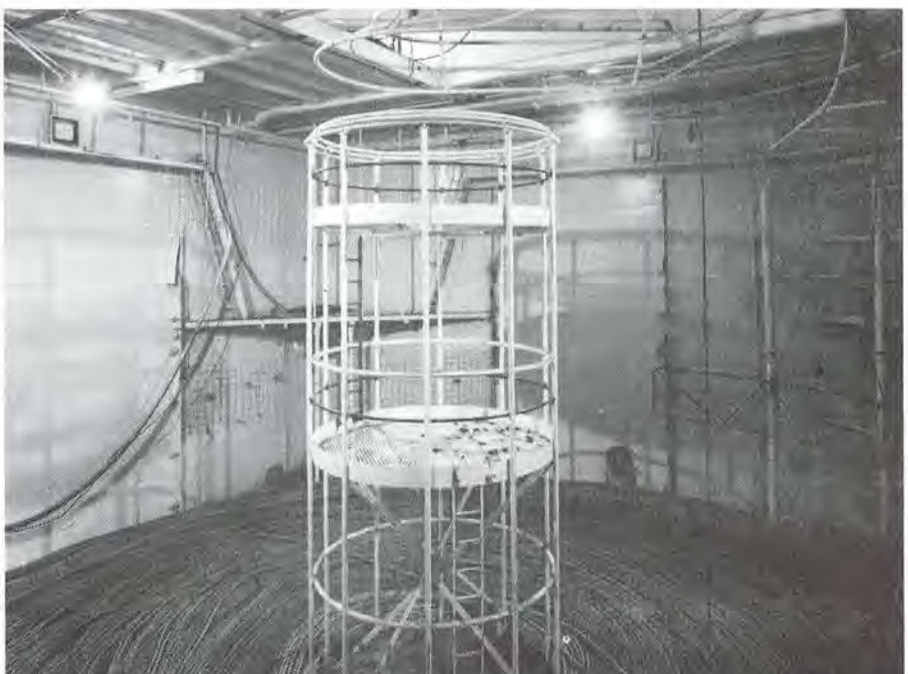
Cable Layers and Cable Repair Ships

Cableships may be broadly categorized as cable layers and cable repair ships. Cable layers are mostly larger and of course capable of making cable repairs. On the other hand, cable repair ships are generally smaller and are often built with particular requirements in mind, such as areas of operation, type of cables to look after, and so on. But some cable repair ships are adaptable to cable laying, particularly for short runs.

For cable laying of long transocean systems the ability to continue in the face of worsening weather dictates the size of the ship, and most layers are around 400 feet length-over-all or larger, with full-load displacement of 10,000 tons and upward.

The cable tanks--cylindrical holds into which cable is coiled--usually are the width of the ship in diameter and extend from the inner bottom of the ship to just below the main or operations deck. Three, four, or as many as five of these tanks enable the larger cable layers to stow thousands of miles of cable--the quantity of course being related to the size of the cable.

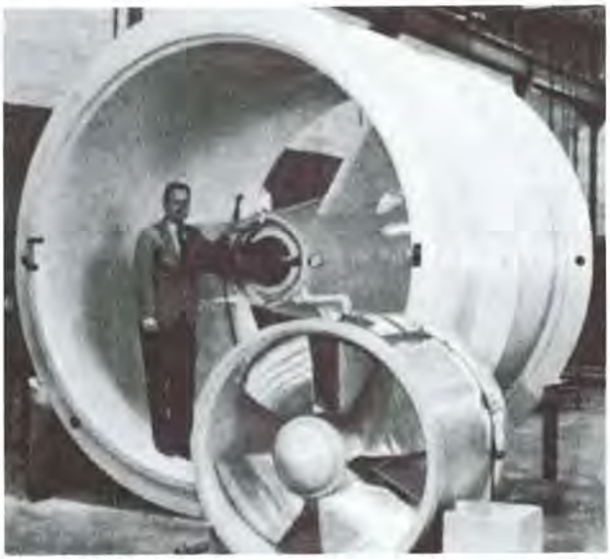
As implied above, all cableships are cable repair ships, and in the exercise of this task must have a high order of maneuverability at low speed, or stopped. Thus cableships have various maneuvering aids in the form of thrusters of one kind or another, means to move the bow or the stern of the ship from side to side when stopped or when backing, taking the form in some instances of tunnel thrusters, and in some, steerable propellers, and even water jets discharging in air. Some of the smaller repair ships make use of cycloidal propellers, allowing infinite range of direction of propulsion, and thrust.



Cable is carried in the ship's holds, usually circular in horizontal section, called tanks, with a structure in the center around which the layers (flakes) of cable are spirally formed. Cable is guided into place by hand even to this day, coming aboard at a rate of one or two knots. Here is seen the interior of a tank in CABLE VENTURE (ex NEPTUN), who possesses the largest cable-carrying capacity of all cableships, having five tanks near the size if this one.

While some larger ships have been steam-turbine powered, direct and turbo-electric, there is a trend toward diesel propulsion, both direct and diesel-electric, with the latter being ac-dc, meaning diesel-driven alternators, rectifiers, and dc motors on the shafts. Cableships generally are content to steam at speeds not over about 16 knots, and the average would be around fourteen. Cableships have large bunkers, for they have to steam from cable manufacturing plants to the location of a cable installation, often halfway around the world, and cable repair ships have to maintain themselves at sea sometimes for weeks without bunkering.

All cableships have large winches called drums mounted at the foreship on horizontal axes, always two side by side, variously powered, capable of lifting cable over the wheels called sheaves at the bow at tensions greater than the breaking strength of the heaviest armor. To retrieve a cable from the sea-bottom the ship deploys a grapnel at the end of a rope long enough to lie on the bottom, and steams slowly across the track of the cable. When the cable is engaged, it is drawn up and inboarded at the bow in cases where there is sufficient slack, and in cases without sufficient slack the cable is cut and only one end brought up at a time. Suffice to say that this abbreviated account leaves wide gaps in the intricate details of cableship operation in effecting repairs.



Every cableship needs maneuvering aids--means to exert thrust from side to side at bow and stern, or ways of exerting thrust at directions other than directly ahead or astern. At left may be seen two sizes of tunnel thrusters on the factory floor. These may be fitted in transverse tunnels completely through the hull from port to starboard, often at both bow and stern. At right, another aid, the active rudder, wherein a powerful motor is embedded in the rudder blade, with a propeller to exert thrust in the direction of the plane of the rudder. Other special maneuvering ability accrues to ships with steerable, retractable propellers, or the cycloidal propeller.

Most ships used for cable laying have special machinery for controlling the discharge of cable mounted in the aftership. Though some early cable-layers had drum-type payout engines, all recently-built layers have linear machines, intended to allow the continuous payout of cable and repeaters (or regenerators) at fixed speed, usually about 6 knots.

Several of the larger cableships are specifically equipped to deploy and tow cable plows. To overboard and recover the plow, usually a sled-like device weighing up to 20 tons, the ship must have a crane or A-frame at the fantail. The plow has a share extending downward, which, when the plow is towed forward, incises a trench in the sea-bottom. The share is arranged so that the cable, passing down from the ship into the plow, will run through the share and be deposited in the bottom of the trench, 2 or 3 feet deep into the sea floor.

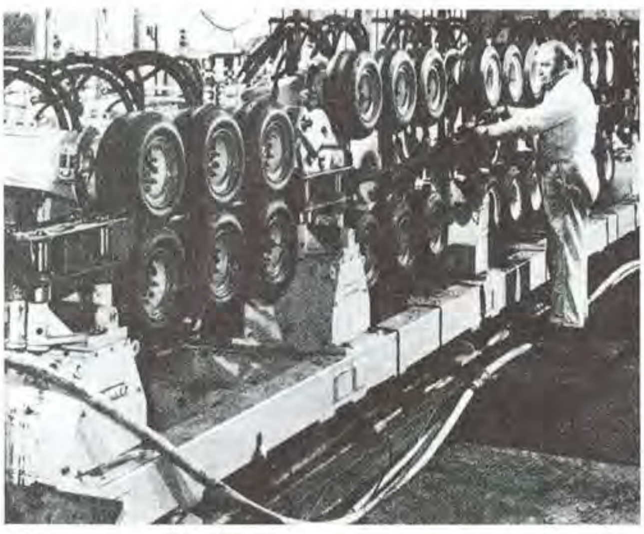
Plowing is done at slow speed--1 or 2 knots--and requires a hefty pull from the ship, as much as 50 tons or more.

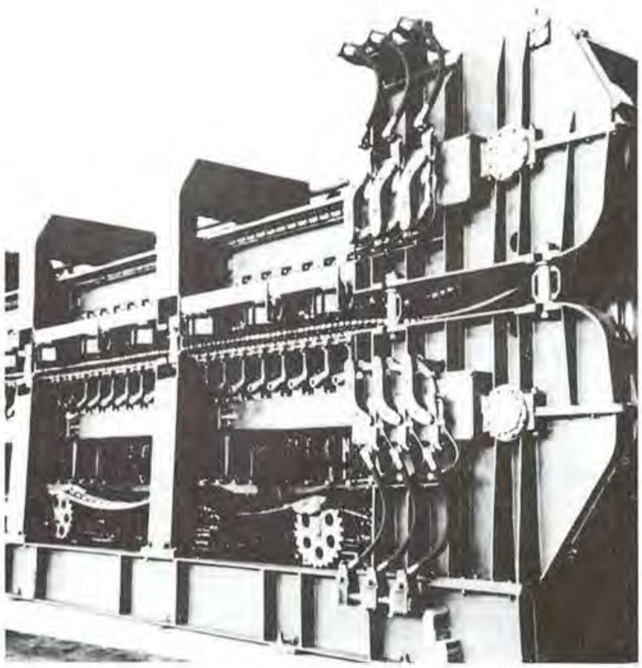
The development by the offshore petroleum industry of underwater work vehicles, manned and un-manned, has encouraged the use of such devices by the submarine cable community to deal with plowing and inspection of the result of plowing, as well as the recovery of plowed-in cable in the fortunately rare instances that this is required. The stowage and deployment of the vehicles usually requires special facilities as well as dedicated control consoles for guiding and actuating the vehicles.

Modern cableships, exemplified by the U.S. Navy's newest, USNS ZEUS, T-ARC 7, are extensively automated with respect to the engine room and for maneuvering. By the centralized and computerized facilities the ship can be maneuvered to hold position over a fixed point on the bottom as an example, by the hand of one man, and the engine room is totally unoccupied. Japanese cableship KUROSHIO MARU performs computerized cable laying, even to plowing, through pre-programmed instructions, and the ship plows and deposits cable in a complete hands-off condition.

Many cable projects involve lengths of cable greater than the capacity of the cableship or ships available for the task. Therefore it has become almost routine for a layer to deposit say a thousand miles, buoy off the end, return to the cable factory, load the second thousand, steam out, pick up the buoy, splice on, and lay the next length. It was mentioned that the new fiber-optic cables are small compared to the later sizes of analog cables. What this means in terms of cableship utilization can only be welcomed warmly by all concerned, allowing the more modest-capacity cable-layers to accomplish great feats of cable mileage carried and laid.

It was--and is--desirable to conduct cable-laying at constant speed and until the linear cable payout engine appeared this was generally impossible. At right: The AT&T-developed linear engine seen on the factory floor at Western Gear Corporation before being fitted to cableship LONG LINES. Two engines were built; none others have been ordered.



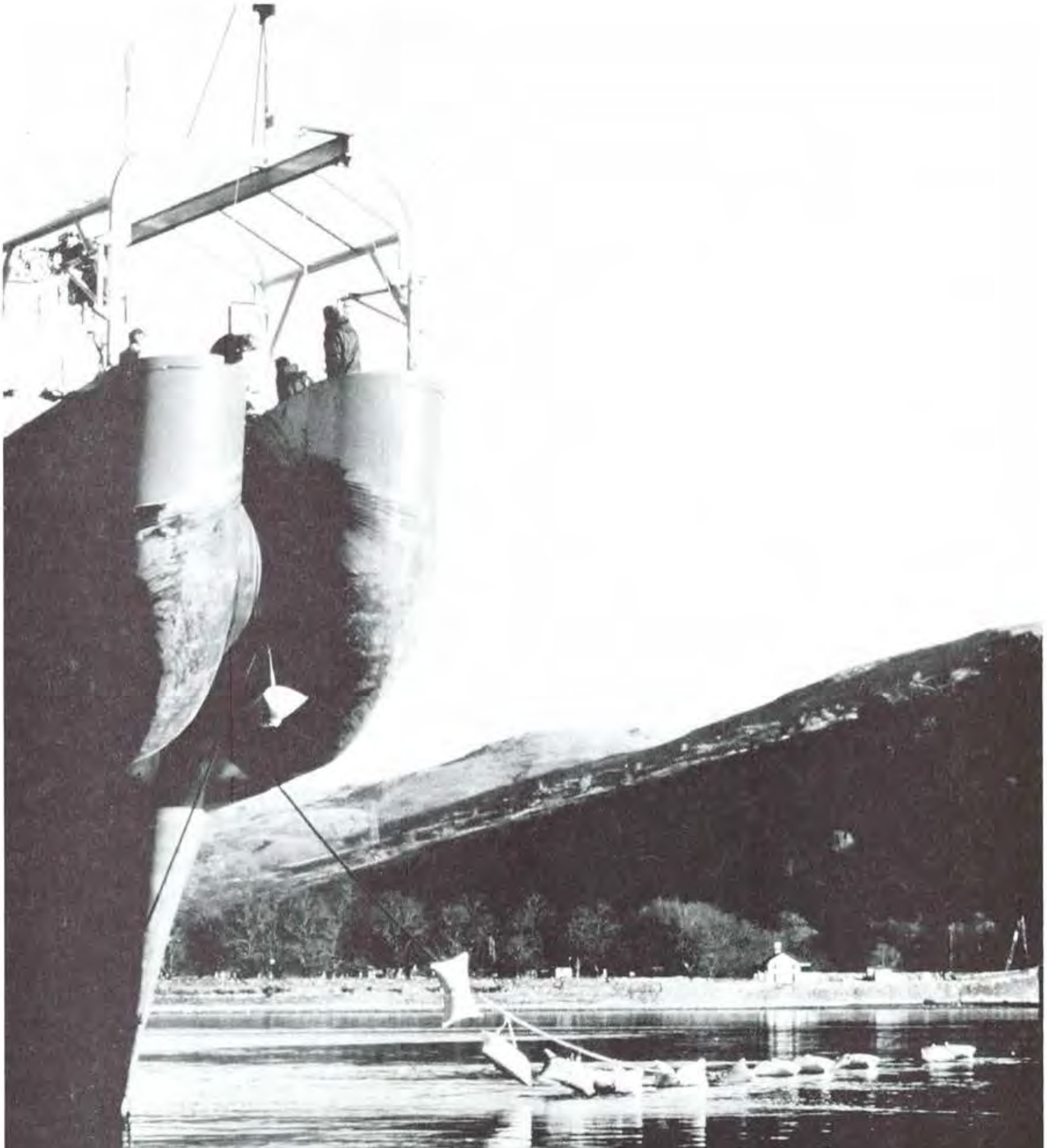


At left: Developed jointly by the British Post Office and Dowty Boulton Paul Ltd., the Dowty engine has enjoyed wide acceptance, having been supplied for seven ships: British, French, Canadian, and Soviet.

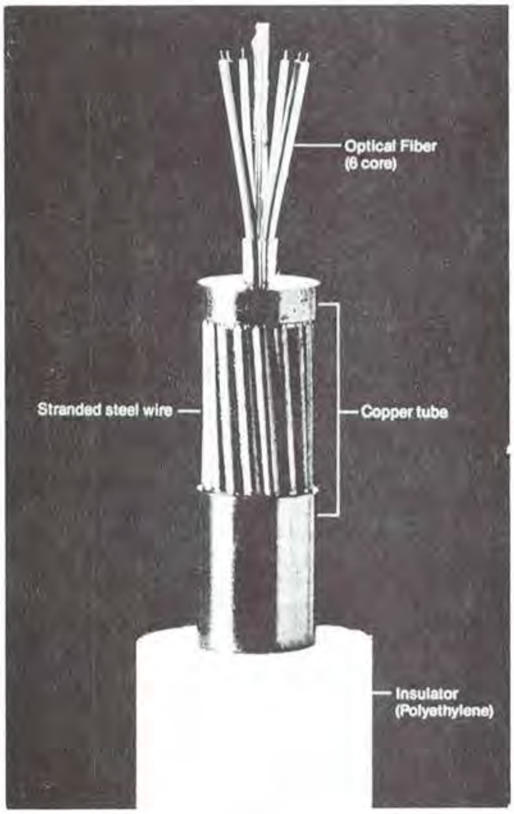
Cableship RAYMOND CROZE with sister-ship LEON THEVENIN have recently been completed and commissioned in France. In 1981 the government of France had ordered construction of a new cableship to repalce the aging AMPERE, when a disasterous fire occurred on their cableship MARCEL BAYARD in harbor at Toulon, rendering her a total loss. This prompted the government to cancel the order for AMPERE's replacement and order instead two more ships slightly smaller. These new vessels represent the state-of-the-art in cableship design and construction.

SIGNIFICANT CABLESHIPS OF THE WORLD
IN ORDER OF LENGTH OVER ALL

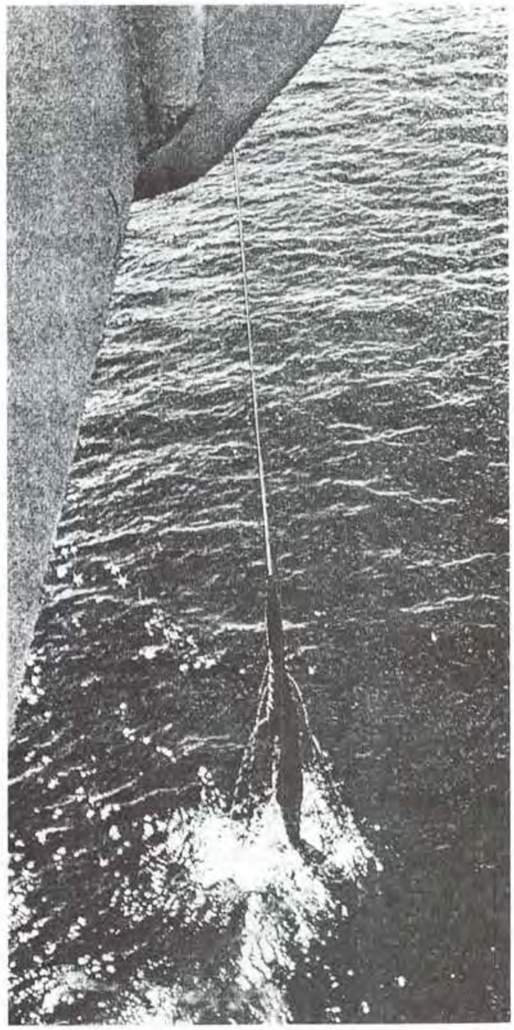
L. O. A.	436-525 ft.	Reference Number	Flag
511.5	ZEUS (T ARC-7)	8005	U.S. A.
511.5	LONG LINES	6011	U. S. A.
493.9	CABLE VENTURE	6009	U. K.
473.8	MERCURY	6008	U. K.
436.3	VERCORS	7008	France
	380-436 ft.		
429.1	MUROTO	8001	Japan
427.9	DONETS	6020	U. S. S. R.
427.9	ZEYA	6021	U. S. S. R.
427.8	INGUL	6006	U. S. S. R.
427.8	JANA	6007	U. S. S. R.
427.8	KATUNJ	7001	U. S. S. R.
427.8	TAVDA	7005	U. S. S. R.
427.8	INGURI	7006	U. S. S. R.
426.5	ALERT	6002	U. K.
391.3	KUROSHIO MARU	7011	Japan
	350-380 ft.		
377.3	PACIFIC GUARDIAN	8007	U. K.
373.5	KDD MARU	6016	Japan
371.4	CABLE ENTERPRISE	6012	U. K.
370.0	RETRIEVER	6005	U. K.
370.0	NEPTUNE (T ARC-2)	4019	U. S. A.
362.0	ALBERT J MYER	4020	U. S. A.
351.0	RAYMOND CROZE	8011	France
351.0	LEON THEVENIN	8012	France
	300-350 ft.		
340.5	RECORDER	5005	U. K.
339.6	SALERNUM	5009	U. S. A.
323.0	NEWTON	7009	U. K.
319.0	MONARCH	7002	U. K.
319.0	IRIS	7003	U. K.
318.2	FUTAMI	7021	Japan
313.4	JOHN CABOT	6013	Canada
	245-300 ft.		
299.5	AMPERE	5002	France
277.4	TSUGARU MARU	6019	Japan
271.5	NORTHERN	6010	Denmark
263.0	ST MARGARETS	4016	U. K.
257.0	PETER FABER	8006	Denmark
252.0	CABLE RESTORER	4012	South Africa
249.0	EMBA	8002	U. S. S. R.
249.0	NEPRYADVA	8003	U. S. S. R.
249.0	SETUN	8004	U. S. S. R.



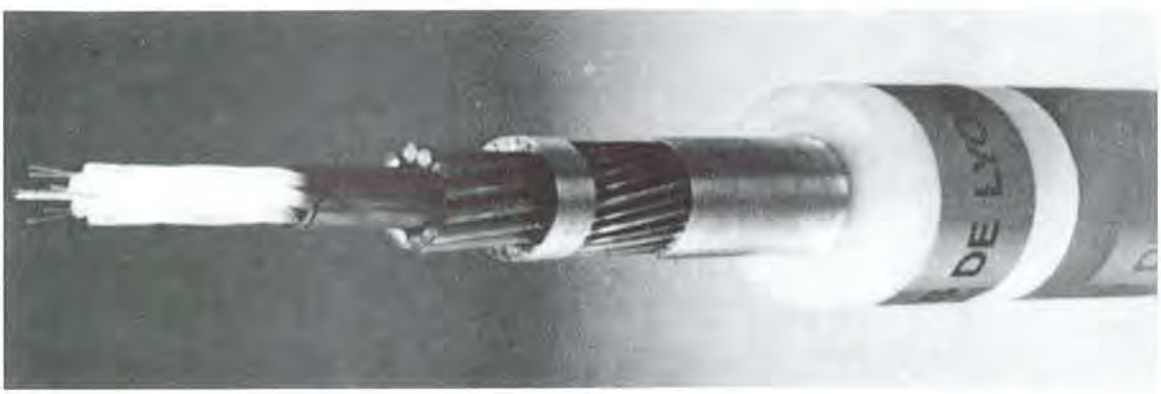
The first sea-trial of a fiber-optic submarine telephone cable system took place at Loch Fyne, Scotland in February 1980. Here the shore end of the cable is being paid out from the bow of cableship IRIS (3). The project was a joint enterprise of British Telecom International and Standard Telephones and Cables Ltd.



Close-up view of a fiber-optic submarine telephone cable design produced jointly in Japan by KDD, NTTPC, and Ocean Cable Company Ltd.



Fiber-optic cable and regenerator being inboarded at the bow of cableship LONG LINES following successful deep-sea trials by AT&T in September 1982.

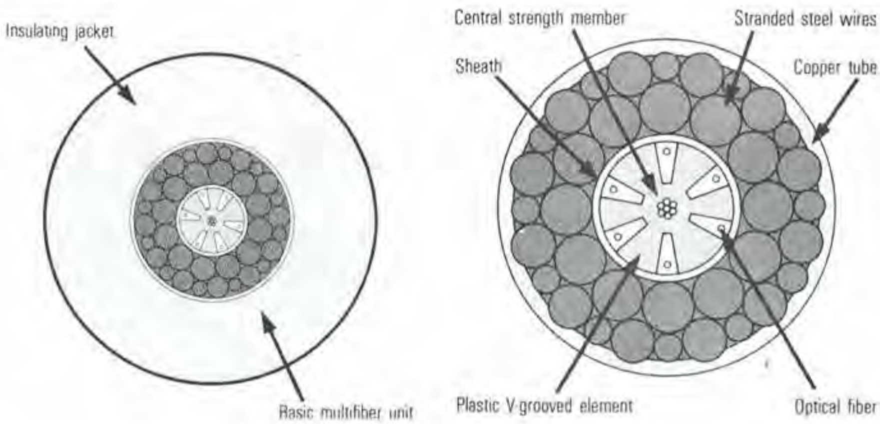


Close-up view of a fiber-optic cable design developed in France by CNET and Les Cables de Lyon the fibers, is relatively small. Since the cable has to satisfy certain mechanical requirements regardless of the size of the transmission part its dimensions cannot be reduced beyond a certain limit. Since the fibers are extremely small (less than 1 mm) it is safe to say that even in the event of a high number of fiber pairs the cable dimensions are dictated by mechanical considerations.

Various entities have developed a number of cable designs. A typical design, one of many, has stranded steel wires in the center, just as the lightweight armorless cable design, then a ring of fiber pairs, typically 6, around the center member, and fillers and protective sheaths on top of the core. Other developments show the fiber pairs in the center and protective elements, armor wires, on the outside. All designs provide a copper tube somewhere in the cable structure which has electrical (power-feed) and mechanical (water-tightness) functions.

There are several modes of light transmission which have been investigated with regard to advantages and disadvantages, and there seems to be a consensus to employ single-mode (SM) configuration. A typical single-mode design consists of a fiber of 0.9 mm diameter and a "cladding" out to a diameter of 2.5 mm for each fiber.

One of the problems with fibers is splicing. The fibers are thin and brittle and require careful handling, making fiber splicing far more delicate than the conventional coaxial procedure of joining robust copper conductors and the injection of polyethylene.



Transverse section views of a design of fiber-optic submarine telephone cable produced in France as a joint enterprise of CNET and Les Cables de Lyon. Left, the whole cable; right, enlarged section of the core.

The Housings for the Submerged Units

The mechanical housing as it was developed for conventional analog systems had to meet a number of requirements, among which were:

It must not collapse under the pressure of deep sea;

It must be water-tight;

It must be able to transmit the cable tension under laying and recovery activity;

It must be corrosion-resistant:

The electrical part of the cable must penetrate the bulkhead of the housing;

It must be installable with various types of cableship machinery.

It is safe to say that the traditional manufacturers of underwater repeaters had these requirements very much under control; reliability of the housing has been no problem for many years. Fortunately the housing requirements for fiber-optic regenerators are similar to those of the analog repeaters as listed above. The most prominent difference is the penetration of the individual fibers to the internal electro-optical circuitry. In the case of three pairs (6 fibers), there are six penetrations at each end. The problem is aggravated by the smallness and brittleness of the fibers. Thus it is not surprising that the size of the splice chambers inside the mechanical housing is much greater for the fiber-optic regenerators than for the conventional analog repeaters, where only one robust coaxial had to penetrate the bulkheads.

Regenerators

Basically, digital regenerators and analog repeaters have the same purpose: to refresh or restore the transmission signal before it deteriorates to a degree that might affect the overall transmission quality. In the case of analog repeaters the nature of the deterioration is the excessive accumulation of noise; in the case of digital regenerators it is the error rate when it exceeds acceptable limits.

Compared to fiber-optic regenerators, analog repeaters are relatively simple; just a remotely-energized, bidirectional amplifier with some more-or-less sophisticated supervisory circuitry.

Digital regenerators are inherently more complex, having to perform quite a number of important tasks:

Restore the signal;

Select the working regenerator (when regenerator redundancy is provided);

Select the working transmitter (when transmitter redundancy is provided);

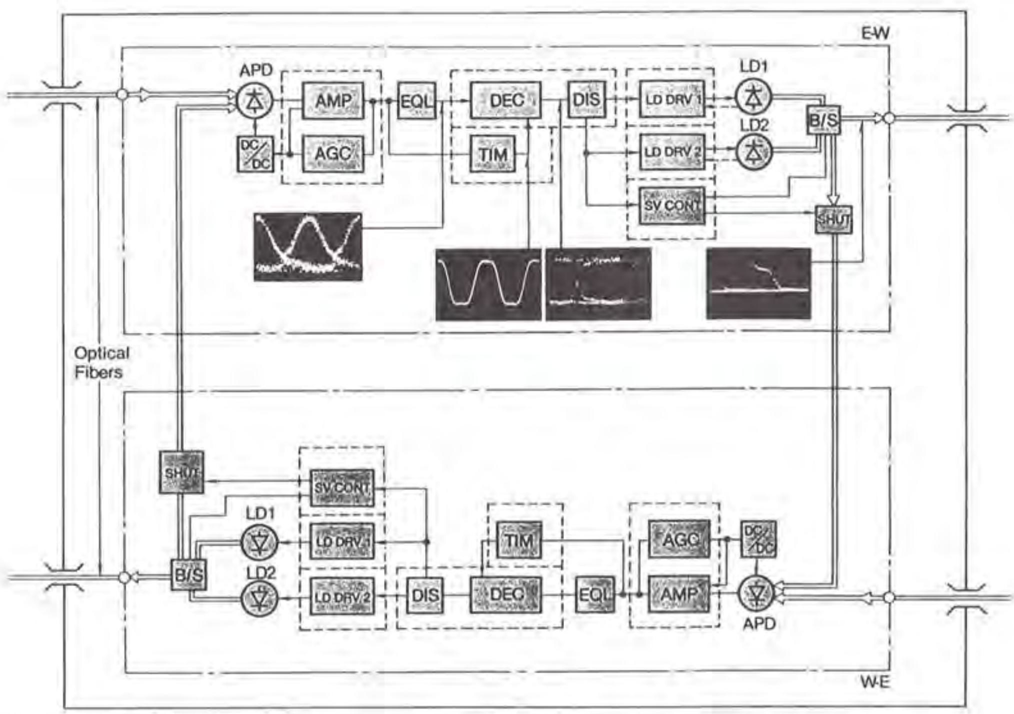
Monitor its own performance;

Respond to supervisory commands;

Provide for energizing the electronic circuitry.

In particular, it is the various types of redundancy that separates the regenerative function from its analog counterpart. In the case of the AT&T technology there is an extra fiber pair available (in addition to the two regular pairs) which can replace either of the working fiber pairs. As soon as a malfunction is detected, a switch-over to the stand-by pair can be effected.

Based on the assumption that the optical transmitter is the weakest link in the regenerator chain, a switched, four-transmitter redundancy is provided. By means of a power switch, any of the four transmitters can be inserted when the detecting device is triggered.



APD: Avalanche Photo Diode
LD: Laser Diode
AMP: Amplifier
AGC: Automatic Gain Control
EQL: Equalizer
DC/DC: DC-DC Converter
SHUT: Shutter
DEC: Decision
TIM: Timing
DIS: Distributor
LD DRV: LD Driver
SV CONT: Supervisory Control
B/S: Beam Splitter

Block diagram of a submersible regenerator as developed in Japan in a joint project of NTTPC, KDD, NEC Corporation, and Fujitsu Ltd.

System Data

The established seacable system manufacturers have published data showing the characteristics of their systems. As can be seen from the following tabulation, there are no drastic differences. This is particularly true for the transmission speed which is almost always a multiple of the 140 MBS as recommended by CCITT.

FIBER OPTIC SYSTEM DESIGNS

Country	France	Japan	Japan	U. K.	U. S. A.	Japan
Entity	SUBMARCOM CIT-ALCATEL	NEC Corp.	NTTPC	STC Submarine Systems Ltd.	AT&T	KDD
Designation	S. 280	280 M	*	NL 1	SL	OS-280 M
Transmission Rate per pair	280 Mb/s	280 Mb/s	280 Mb/s	280 Mb/s	295.6	280 Mb/s
Channel Capacity	4000	4032	*	12,000	40,000	3780
Multiplication Factor	5. . . 8	*	*	3	5	5
System Length	7,500 km	10,000	1,000	7,500	8,000	10,000
Regenerator Spacing	45 km	50	25	25. . . 30	30. . . 35	30. . . 50
Maximum Sea Depth	6,500 m	8,000	8,000	7,500	7,500	8,000
Bit Error Rate	$4 * 10^{-8}$	10^{-8}				10^{-8}
Design Life	25 years	25	15	15	25	25
System MTBF	2 in lifetime	more than 10 years	10	10	3 in lifetime	10
Fiber Size	*	0.9 mm	*	Core: 8.5 µm	Core 2.6 mm	*
Number of Fibers	2 pairs	3 pairs	2. . . . 4	3 pairs	12 TAT 8: 6	2 pairs
Fiber Mode	SM	SM	SM	SM	SM	SM
Wavelength	1.3um	1.3	1.3	1.3	1.3	1.3
Cable Design	Center steel	King wire; 2 copper tubes	*	*	*	Center steel
Cable Loss	0.42 dB/km	0.5	*	0.5	0.38	0.5
Cable Diameter	15 mm	19	*	*	21	*

* Not reported

Experimental Systems

Although many steps in the development of a new seacable technology can be performed in the laboratory or by test facilities simulating the ambiance for which the system is intended, there is no substitute for actual sea trials where the environmental parameters are as realistic as possible.

The ideal situation would be an experimental link between two terminal stations so that the characteristics of the link can be monitored as long as desired. If such an experimemtal link can be used for traffic, so much the better. A good example of this philosophy was the installation of the Key West - Havana submarine telephone cable that was commissioned in 1950 (System Reference No. 5). It served as a precursor to what later became known as the AT&T SB system, used for the pioneer transatlantic project "TAT 1" (System Reference No. 30) in 1956.

If a two-terminal experimental system cannot be implemented for whatever reason, the next best configuration is a loop where at the end of the laying operation both cable ends are on board the ship and the cable can be tested. A variant of this configuration is a loop with both ends connected to a terrestrial terminal station and thus available for long-term testing and observation.

As of mid-1984 a total of 13 experimental systems (and sea trials) have been implemented.

FIBER OPTIC EXPERIMENTAL SYSTEMS

Project Reference Number	225	226	239	Un-numbered	242	243	244	247	256	265	273	274	Un-numbered
Country	U.K.	Japan	Japan	Japan	Japan	Japan	U.S.A.	France	U.K.	France	Spain	France	Japan
Entity(ies)	STC BTI	NTT	NTT	KDD	KDD	NTT	AT&T	CNET CGE	STC	CNET CGE	CTNE AT&T	CNET CGE	KDD
Date	1980	1980	1981	1981	1982	1982	1982	1982	1983	1984	1985	1985	
Location	Loch Fyne	Izu Peninsula	Sagami Bay	Sagami Bay	Sagami Bay	Sagami Bay	500 nm ENE of Bermuda	Mediter-ranean		Mediter-ranean	Canary Islands	Mediter-ranean	200 km SE Okinawa
Landing Points	Loop	Inatori Kawazu			Ninomiya Loop	Yahatano	Ship Loop	Cagnes-Sur Mer and Juan-Les-Pins		Port Gri-maud, An-tibes	Las Can-teras, Las Calletilas	Marseille Ajaccio	Ship Loop
Length of Cable, km	10	10.2	1.3	4.5	50	45	18.2	20		80	104	400	24
Cable Design	4 MM 2 SM	5 SM 5 GI	6 fibers	6 SM	6 SM	4 SM	12 SM	2 SM 4 MM			6 MM	2 fiber pairs	
Water Depth, meters	Shallow	200	700	500, 1000, 1500	1300	1000	5000	1000	Deep	1300		2500	5000-7000
Number of Regenerators	1	none	1	1	2	2	2	none		2	4 + 2	8	2
Fiber Mode	SM MM	as above		SM	SM	SM	SM	as above		SM		SM	
Number of Pairs	3	as above				2	6	3		2		2	
Wavelength, microns	1.3	1.3	1.3	1.3	1.3	1.3		1.3		1.3		1.3	
Transmission Rate, Mb/s	140	6.4, 32, 100	400	280	300	400	274, 420	34		280	295.6	280	

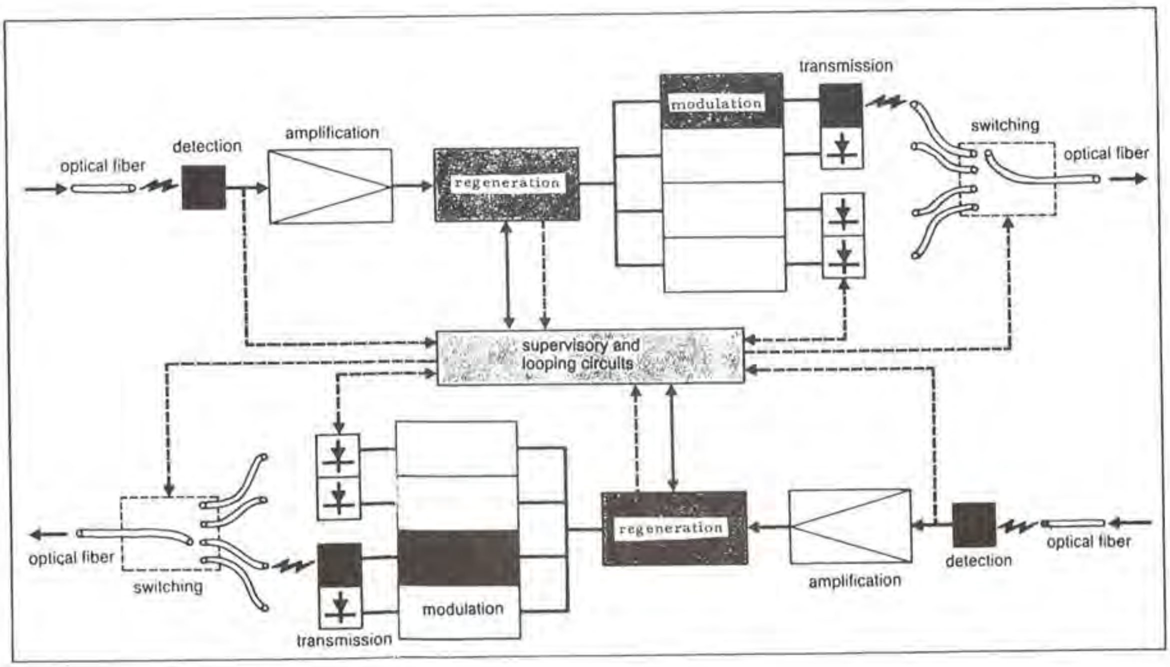
Branching

Virtually all currently-operating seacable systems are configured as a single line from one landing point to another landing point. Since traffic requirements for different countries are not identical, it would be advantageous to be able to implement a tree configuration where the various branches go to different countries. Such configurations have been proposed over the years again and again but were never realized.

To a certain extent the ICECAN system (Reference No. 55) landing at the southern end of Greenland at Frederiksdal has a branched configuration. There are two sets of shore-end cables connected to two underwater switching devices, so that in case of damage to one cable from, say, grounding icebergs, a common threat there, the other branch can be activated by sending an appropriate signal from the landing station.

The new digital fiber-optic technology makes branching easy by dedicating certain fiber pairs to certain sub-systems. The next transatlantic project, TAT 8, under contract for service in 1988, is being built principally by AT&T. It provides for branching on the European end, where an underwater branching unit will rest on the bottom near the edge of the continental shelf. From there a modified British NL system produced by STC Submarine Systems Ltd. will link the branching unit to the Cornish coast, while a similarly-modified French system made by SUBMARCOM will come ashore in France.

It is to be expected that in the future there will be numerous situations in which branching will be desirable, and now technically convenient.



Block diagram of a submersible regenerator as developed in France as a joint enterprise of CNET and SUBMARCOM/CIT-ALCATEL.

Manufacturing

The same firms that are today the producers of analog submarine telephone cable systems are those who so far have entered the fiber optic field.

In the United States, AT&T pioneered the development of lightwave transmission a decade or more ago, and today is the only source for the development and production of electronics and optics for the new technology for submarine service. Simplex Wire and Cable Company has the only production facility for submarine telephone cable--coaxial or fiber optic--and they produced the prototype cable to be used for TAT 8 under AT&T sponsorship. AT&T has also the project management capability and the cableships, and are the systems contractors for TAT 8.

In Great Britain, British Telecom International and Standard Telephones and Cables PLC have both engaged their laboratories in simultaneous development work on fiber optic technology, both electronic-optic and cable. The submarine telephone cable work of STC is done today under the rubric of STC Submarine Systems Ltd. Though STC SSL have no operative cableship of their own, they have whole-project management capability and may access the cableships of Cable and Wireless and BTI. STC SSL are the contractors for the U.K. - Belgium No. 5, a fiber-optic system due for service in 1985. The only source for submarine telephone cable--coaxial or fiber-- is the STC SSL plant at Southampton.

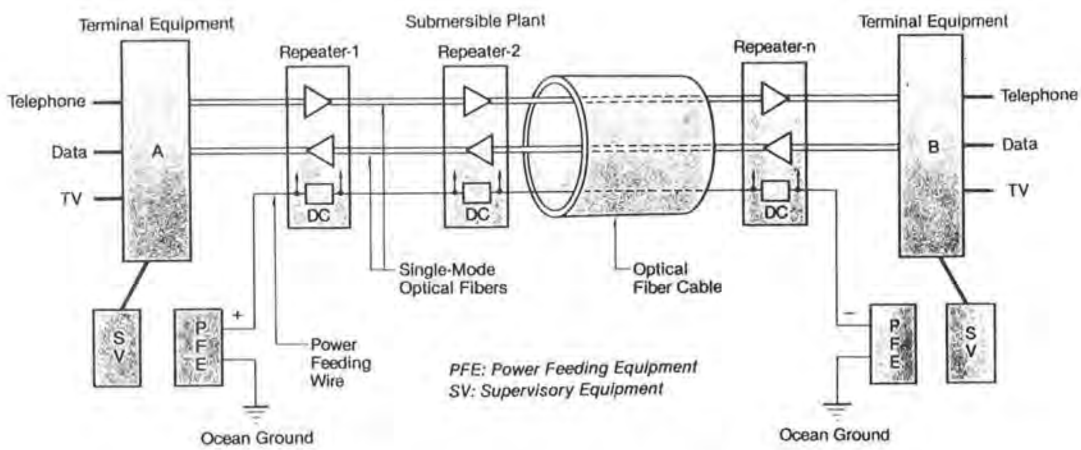
In France, the two members of the family of Compagnie General de Electricité, Les Cables de Lyon and Compagnie Industrielle des Télécommunications CIT-ALCATEL, are joined in an enterprise named SUBMARCOM which undertakes whole-project management. CIT-ALCATEL and Cables de Lyon are the sole makers respectively of electro-optics and cable for submarine service in France. Though having no cableship of their own, SUBMARCOM has access to the fleet of the French government. Under sponsorship by the Centre National d'Etudes des Télécommunications the French developments in fiber-optic submarine systems have been tested by SUBMARCOM, and they are to be the contractors for a system connecting the mainland to Corsica in 1985.

In Japan, the laboratories of Nippon Telegraph and Telephone Public Corporation, the purveyors of the national telecommunications services, and of Kokusai Denshin Denwa Co. Ltd., the same for the international service, have worked with NEC Corporation and Fujitsu Ltd. in the development of the optical and electronic requirements for fiber optic submarine telephone cable systems. Ocean Cable Company Ltd. has produced designs of fiber optic cable by both.

NTTPC and KDD have project management capability, as do also both NEC Corporation and Fujitsu Ltd. Both NTTPC and KDD have cableships.

Conclusion

The scene has now changed dramatically because of the arrival of the new technology, fiber optics. The bandwidth advantage of satellite communication no longer exists, cable transmission delay remains unnoticeable, seacable networks are more versatile because of the new branching feature, and finally, cables have no troubles with geostationary parking space and consume zero of the precious radio-frequency spectrum.



General layout of the fiber-optic submarine telephone cable system as developed in Japan. The system layout for all present designs--British, French, Japanese, and American--are very similar.

LIST OF THE WORLD'S SUBMARINE TELEPHONE CABLE SYSTEMS

1943 - 1983

This list names all of the known undersea telephone cable systems that have contained at least one submerged electronic device (repeater or regenerator)*, and that were in service at least sometime during the period from the first installation of a submerged repeater in 1943 through the end of 1983.

Data files maintained by various entities in the seacable industry--manufacturers, owners, historians--have been exposed from time to time but until the first edition of this publication appeared in 1975, there was no single source of complete and verified data.

* An exception has been permitted to allow the listing of experimental fiber-optic submarine cable installations leading to subsequent installations with submerged electronics.

The first edition was prepared from the seacable system data file of this contractor, reinforced with inputs from builders and owners. The present edition has been compiled using the same methods as for the first, with recourse to some additional sources.

The list has been arranged in approximate chronological order and the System Reference Numbers are those of the contractor's data file beginning with what is generally recognized as the first application of a submerged repeater in a submarine telephone cable in 1943.

Immediately following the list is an alphabetic tabulation of the systems by countries, terminal points, and landing sites, as well as acronyms and system names.

More and more submarine telephone cable projects are turning to cable burial in the sea-floor for reducing the likelihood that the cable will be disturbed by some man-initiated surface activity--trawling, for instance. Here KDD MARU, assisted by a tug, is simultaneously laying and burying the Japan-to-Mainland China cable for the part of the route having depth less than approximately 100 fathoms.

At left, the plow is hoisted out from the ship preparatory to lowering to the bottom. The cage-like structure reaches from the plow up to the stern of the ship and guides the cable and repeaters into the maw of the plow.

At right, the view from the stern of the ship shows the cage leading from the ship to the plow on the sea-bottom.

LIST OF THE WORLD'S SUBMARINE TELEPHONE CABLE SYSTEMS WITH SUBMERGED REPEATERS

1943 – 1983

SYSTEM REFERENCE NUMBER	IDENTIFICATION	DATE(S)
1	UNITED KINGDOM HOLYHEAD - PORT ERIN (RETIRED)	1943 (1951)
2	U.K. - GERMANY, FED. REPUBLIC (MIL) LOWESTOFT - BORKUM (RETIRED)	1946 (1969)
3	FRANCE TOULON - AJACCIO (RETIRED)	1946 (1946)
4	FRANCE NICE - CANNES (RETIRED)	1950 (1951)
5	U.S. - CUBA KEY WEST - HAVANA	1950
6	NETHERLANDS - DENMARK 1 OOSTMAHORN - ROMO 1 (UP-GRADED TO BECOME NO 31)	1951 (1957)
7	NETHERLANDS - DENMARK 2 OOSTMAHORN - ROMO 2 (UP-GRADED TO BECOME NO 46)	1951 (1961)
8	U.K. - NETHERLANDS 1 ALDEBURGH - DOMBURG 4 (RETIRED)	1951 (1972)
9	U.K. - NETHERLANDS 2 ALDEBURGH - DOMBURG 5 (RETIRED)	1951 (1972)
10	NUMBER UNASSIGNED	
11	NUMBER UNASSIGNED	
12	U.K. - DENMARK (GNT) WEYBOURNE - FANO (UP-GRADED TO BECOME NO 37)	1952 (1957)
13	U.K. - GUERNSEY 2 DARTMOUTH - FORT DOYLE 1 (RETIRED)	1952 (1972)
14	U.K. - GUERNSEY 3 DARTMOUTH - FORT DOYLE 2 (RETIRED)	1952 (1972)
15	NUMBER UNASSIGNED	
16	U.K. - IRELAND HOLYHEAD - DUBLIN A	1953
17	U.K. - IRELAND HOLYHEAD - DUBLIN B	1953
18	U.K. - NETHERLANDS 3 LOWESTOFT - SCHEVENINGEN 1 (RETIRED)	1954 (1977)
19	U.K. - NETHERLANDS 4 LOWESTOFT - SCHEVENINGEN 2 (RETIRED)	1954 (1977)
20	U.K. - NORWAY 1 ABERDEEN - BERGEN	1954
21	ITALY - MALTA "MED 1" POZZALO - ST GEORGES	1955
22	NUMBER UNASSIGNED	
23	TUNISIA KELIBIA - BOU FICHA	1956
24	NORWAY - DENMARK 1 KRISTIANSAND - THISTED 1	1956
25	NUMBER UNASSIGNED	
26	ITALY - TUNISIA MAZARRA - PANTELLERIA - KELIBIA	1956
27	UNITED STATES PORT ANGELES - KETCHIKAN (RETIRED)	1956 (1979)
28	DENMARK - NORWAY 2 HJORRING - ARENDAL (RETIRED)	1956 (1979)
29	NETHERLANDS - DENMARK 3 WESTTERSCHELLING - MAADE	1956
30	U.K. - CANADA "TAT 1" OBAN - CLARENVILLE - SYDNEY MINES (RETIRED)	1956 (1978)
31	NETHERLANDS - DENMARK 4 OOSTMAHORN - ROMO 3 (UPGRADE OF SYSTEM NO 6) (RETIRED)	1957 (1983)
32	U.K. - NETHERLANDS 5 ALDEBURGH - DOMBURG 6 (RETIRED)	1957 (1983)
33	UNITED STATES "HAW 1" POINT ARENA - HANAUMA BAY	1957
34	FRANCE - ALGERIA 1 MARSEILLE - BORDJ-EL-KIFFAN 1	1957
35	CANADA - GREENLAND CAPE DYER - THULE (RE-CONFIGURED TO BECOME NO 65)	1957 (1964)
36	ITALY CIVITAVECCHIA - GOLFO D'ARANCI 1 (RETIRED)	1957 (1982)
37	U.K. - DENMARK (GNT) WEYBOURNE - FANO (UPGRADE OF SYSTEM NO 12)	1957
38	U.K. - JERSEY 1 TUCKTON BRIDGE - ST HELIER 1	1958
39	U.K. - BELGIUM 1 DUMPTON GAP - MIDDELKERKE	1958
40	NUMBER UNASSIGNED	
41	FRANCE - CANADA "TAT 2" PENMARC'H - CLARENVILLE (RETIRED)	1959 (1982)
42	UNITED STATES "FLORICO" WEST PALM BEACH - SAN JUAN	1960
43	SWEDEN - U.K. GOTEBORG - MIDDLESBROUGH (RETIRED)	1960 (1983)
44	DENMARK - POLAND COPENHAGEN - BORNHOLM - MIELNO	1960
45	NUMBER UNASSIGNED	
46	NETHERLANDS - DENMARK 5 OOTMAHORN - ROMO 4 (UPGRADE OF SYSTEM NO 7) (RETIRED)	1961 (1983)
47	CANADA CAPE DYER - WHITE BAY (RE-CONFIGURED TO BECOME NO 65)	1961 (1964)
48	CANADA - U.K. "CANTAT 1" CORNER BROOK - OBAN	1961
49	DENMARK FREDERIKSHAVN - LAESO (RETIRED)	1961 (1975)
50	DENMARK GRENA - ANHOLT (RETIRED)	1961 (1975)
51	UNITED KINGDOM COLWYN BAY - DOUGLAS	1962
52	ITALY TRAPANI - CAGLIARI (RETIRED)	1962 (1982)
53	ITALY - GREECE 1 "MED 2" CATANIA - KHANIA (RETIRED)	1962 (1976)
54	U.K. - FAROES - ICELAND "SCOTICE" GAIRLOCH - VELBESTAD - VESTMANNAEYJAR	1962
55	ICELAND - GREENLAND - CANADA "ICECAN" VESTMANNAEYJAR - FREDERIKSDAL - CORNER BROOK	1962
56	FRANCE - ALGERIA 2 CANET PLAGE - MERS-EL-KEBIR	1962
57	U.S. - BERMUDA "BER 1" MANAHAWKIN - FLATTS	1962

SYSTEM REFERENCE NUMBER	IDENTIFICATION	DATE(S)
58	UNITED KINGDOM COLWYN BAY - LANCASTER	1962
59	CANADA - HAWAII - FIJI - NEW ZEALAND - AUSTRALIA "COMPAC" (CANADA - HAWAII AND NEW ZEALAND - AUSTRALIA PORTIONS RETIRED)	1963 (1983)
60	NUMBER UNASSIGNED	
61	U.S. - JAMAICA - CANAL ZONE FLORIDA CITY - KINGSTON - FORT SHERMAN	1963
62	U.S. - U.K. "TAT 3" TUCKERTON - WIDEMOUTH	1963
63	GRAND TURK - PUERTO RICO - ANTIGUA GRAND TURK - RAMEY - ANTIGUA	1963
64	U.K. - GERMANY, FED. REPUBLIC 1 WINTERTON - LEER 1	1964
65	CANADA - GREENLAND WHITE BAY - THULE (RETIRED)	1964 (1976)
66	U.K. - GERMANY, FED. REPUBLIC 2 WINTERTON - LEER 2	1964
67	U.K. - BELGIUM 2 ST MARGARETS BAY - LA PANNE (RETIRED)	1964 (1983)
68	U.S. - JAPAN "TPC 1" HAWAII - GUAM - JAPAN	1964
69	UNITED STATES "HAW 2" SAN LUIS OBISPO - MAKAHA	1964
70	U.S. - PHILIPPINE REPUBLIC "TPC 1" GUAM - BALER	1964
71	PHILIPPINR REPUBLIC - REPUBLIC OF VIET NAM (484N-A) SAN MIGUEL - NHA TRANG (INACTIVE)	1964 (1975)
72	UNITED STATES "ST T 1" VERO BEACH - ST THOMAS	1964
73	SINGAPORE - MALAYSIA - HONG KONG - U.S. (GUAM) - MADANG - CAIRNS "SEACOM" (SINGAPORE - MALAYSIA - HONG KONG PORTION RETIRED)	1965/1967 (1983)
74	U.K. - DENMARK 1 WINTERTON - MAADE	1964
75	UNITED STATES "OAHU TIE" HANAUMA BAY - MAKAHA	1964
76	U.K. - NETHERLANDS 6 COVEHITHE - KATWIJK 1	1964
77	SPAIN "PENCAN 1" SAN FERNANDO - SANTA CRUZ	1965
78	U.S. - FRANCE "TAT 4" TUCKERTON - ST HILAIRE-DE-RIEZ	1965
79	NUMBER UNASSIGNED	
80	UNITED STATES "WET WASH C" MAKUA - JOHNSTON ISLAND	1966
81	FRANCE CANNES - ILE ROUSSE	1966
82	TORTOLA - BERMUDA BREWERS BAY - DEVONSHIRE BAY	1966
83	U.S. - VENEZUELA 1 ST THOMAS - MAIQUETIA	1966
84	NUMBER UNASSIGNED	
85	NUMBER UNASSIGNED	
86	NORWAY - DENMARK 3 KRISTIANSAND - THISTED 2	1967
87	U.S. - BAHAMAS - TURKS "AFETR" CAPE CANAVERAL - G.B.I. - GRAND TURK	1967
88	REPUBLIC OF VIET NAM DA NANG - QUI NHON - NHA TRANG - CAM RANH BAY - VUNG TAU (INACTIVE)	1967 (1975)

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89	REPUBLIC OF VIET NAM - THAILAND (439L-G) VUNG TAU - BAN SATTAHIP (INACTIVE)	1967 (1975)
90	FRANCE - MOROCCO 1 CANET PLAGE - TETOUAN	1967
91	UNITED KINGDOM GAIRLOCH - STORNOWAY	1967
92	UNITED STATES "ST T 2" JACKSONVILLE BEACH - ST THOMAS	1968
93	U.K. - JERSEY 2 TUCKTON BR2DGE - ST HELIER 2	1968
94	NETHERLANDS - U.K. 7 KATWIJK - COVEHITHE 2 (RETIRED)	1968 (1983)
95	NORWAY - U.K. 2 KRISTIANSAND - SCARBOROUGH	1968
96	FRANCE - ISRAEL "MARTEL" MARSEILLE - TEL AVIV	1968
97	DENMARK RONNE - NYKOBING	1968
98	U.S. - DOMINICAN REPUBLIC ST THOMAS - STO DOMINGO	1968
99	ITALY - GREECE 2 "MED 3" CATANZARO - LEKHAINA (RETIRED)	1969 (1979)
100	ITALY CIVITAVECCHIA - GOLFO D'ARANCI 2	1969
101	ITALY - LIBYA AGRIGENTO - TRIPOLI	1969
102	JAPAN - U.S.S.R. "JASC" NAOETSU - NAKHODKA	1969
103	GERMANY - SWEDEN 1 BURG - MALMO	1969
104	SPAIN - ITALY 1 "BAPI" BARCELONA - PISA	1969
105	PORTUGAL - SOUTH AFRICA "SAT 1" SESIMBRA - STA CRUZ - BAIA DE MORDEIRA GEORGETOWN - MELKBOSSTRAND	1969
106	U.K. - PORTUGAL GOONHILLY - SESIMBRA	1969
107	FRANCE - TUNISIA 1 MARSEILLE - BIZERTE	1969
108	JAPAN MORI - MURORAN 1	1969
109	FRANCE ST RAPHAEL - ST TROPEZ	1970
110	FRANCE - LEBANON MARSEILLE - BEIRUT	1970
111	U.S. - SPAIN "TAT 5" GREEN HILL - CONIL	1970
112	DENMARK STJERNESKANSEN - HALSSKOV	1970
113	SPAIN - ITALY 2 "MAT 1" ESTEPONA - PALO	1970
114	DENMARK COPENHAGEN - AARHUS	1970
115	JAPAN KURE - MATSUYAMA 1 & 2	1971
116	JAPAN SAGAMI BAY 1 (RETIRED)	1971 (1976)
117	JAPAN - REPUBLIC OF CHINA "IJCS" OKINAWA - TAIWAN (RETIRED)	1971 (1980)
118	CANADA - BERMUDA "CANBER" MILL VILLAGE - FLATTS	1971
119	U.K. - SPAIN 1 GOONHILLY - BILBAO	1970

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120	SPAIN "TRANSCAN" LAS PALMAS - PUERTO DEL ROSARIO - ARRECIFE	1971
121	JAMAICA - CAYMAN IS KINGSTON - GEORGETOWN	1971
122	SPAIN "PENBAL 1" BARCELONA - PALMA	1971
123	JAPAN OKINAWA - ZAMAMI - KUMEJIMA	1972
124	U.K. - GERMANY, FED. REPUBLIC 3 WINTERTON - FEDDERWARDEN	1972
125	ITALY - ALGERIA PISA - BORDJ-EL-KIFFAN	1972
126	SPAIN "PENCAN 2" CONIL - LAS PALMAS - TENERIFE	1972
127	U.K. - NETHERLANDS 8 ALDEBURGH - DOMBURG 7	1972
128	U.K. - BELGIUM 3 BROADSTAIRS - MIDDELKERKE	1972
129	FRANCE - ALGERIA 3 MARSEILLE - BORDJ-EL-KIFFAN 2	1972
130	U.K. - GUERNSEY 4 TUCKTON BRIDGE - ST PETER PORT	1972
131	PORTUGAL "CAM 1" SESIMBRA - FUNCHAL	1972
132	U.S. - BAHAMAS WEST PALM BEACH - EIGHT MILE ROCK - NASSAU	1972
133	U.K. - DENMARK "SHEFA" KIRKWELL - LERWICK - TORSHAVN	1972
134	ITALY - EGYPT CATANZARO - ALEXANDRIA	1972
135	JAPAN SAGAMI BAY 2 (RE-LOCATED TO BECOME NO 148)	1972 (1974)
136	U.K. - DENMARK 2 SCARBOROUGH - THISTED	1973
137	EGYPT - LEBANON ALEXANDRIA - BEIRUT	1973
138	U.S. - NETHERLANDS ANTILLES ST THOMAS - ST MAARTEN - CURACAO	1973
139	BRAZIL - SPAIN "BRACAN 1" RECIFE - GRAN CANARIA	1973
140	FRANCE - MOROCCO 2 PENMARC'H - CASABLANCA	1973
141	JAPAN AOMORI - HAKODATE	1973
142	JAPAN MIURA - IBARAKI	1973
143	NUMBER UNASSIGNED	
144	U.K. - CANADA "CANTAT 2" WIDEMOUTH - HALIFAX	1974
145	UNITED STATES "HAW 3" SAN LUIS OBISPO - MAKAHA	1974
146	ITALY - SPAIN 3 "BARO 1" BARCELONA - ROME 1	1974
147	ITALY CIVITAVECCHIA - CAGLIARI	1974
148	JAPAN SAGAMI BAY 2 (RELOCATION OF NO. 135)	1974
149	CHINA, REP. OF - RESTRICTED PROJECT	1974
150	JAPAN MORI - MURORAN 2	1974
151	FRANCE - GREECE - CYPRUS - LEBANON "ARIANE - APHRODITE - ADONIS"	1974

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152	FRANCE SAN RAPHAEL - LA FOUX	1975
153	U.S. - JAPAN "TPC 2" HAWAII - GUAM - OKINAWA	1975
154	GREECE "AEGEUS" AMNISSOS - LAGONISSI	1975
155	GERMANY - SWEDEN 2 BURG - TRELLEBORG	1975
156	ISRAEL - ITALY "TELPAL" TEL AVIV - PALO	1975
157	FRANCE - TUNISIA 2 "ANNIBAL" CANET PLAGE - BIZERTE	1975
158	U.K. - SPAIN 2 GOONHILLY - SOPELANA	1975
159	NETHERLANDS - U.K. 9 DOMBURG - BROADSTAIRS	1976
160	ALGERIA - SPAIN "ALPAL" BORDJ-EL-KIFFAN - PALMA	1975
161	CHINA, PEOPLE'S REPUBLIC TIENTSIN - TAILEN	1975
162	FRANCE - ITALY "MARPAL" MARSEILLE - PALO	1976
163	JAPAN - CHINA, PEOPLE'S REPUBLIC REIHOKU - NANHUI HSIEN	1976
164	JAPAN OKINAWA - MIYAKO JIMA	1976
165	SWEDEN HORNSUDDE - FRIDTORP	1976
166	AUSTRALIA - NEW ZEALAND "TASMAN" BONDI - MURIWAI	1976
167	FRANCE - U.S. "TAT 6" ST HILAIRE-DE-RIEZ - GREEN HILL	1976
168	FRANCE - U.K. 1 COURSEULLES - EASTBOURNE	1976
169	NUMBER UNASSIGNED	
170	NUMBER UNASSIGNED	
171	JAPAN MIYAZAKI - CHINEN	1976
172	NUMBER UNASSIGNED	
173	AUSTRALIA - PAPUA "A PNG" CAIRNS - PORT MORESBY	1976
174	ITALY - TURKEY CATANIA - ANTALYA	1976
175	NUMBER UNASSIGNED	
176	NUMBER UNASSIGNED	
177	ITALY ROME - PALERMO	1977
178	U.K. - BELGIUM 4 ST MARGARETS BAY - ST IDESBALD	1977
179	JAPAN - PHILIPPINE REPUBLIC - HONG KONG "OLUHO" GUSHIKAMI - CURRIMAO - DEEP WATER BAY	1977
180	FRANCE LA SEYNE - BASTIA	1977
181	SENEGAL - MOROCCO "ANTINEA" DAKAR - CASABLANCA	1977
182	NUMBER UNASSIGNED	
183	SPAIN - VENEZUELA "COLUMBUS" AGUIMES - CAMURI CHICO	1977
184	SPAIN "PENBAL 2" VALENCIA - PALMA	1977
185	NUMBER UNASSIGNED	
186	DENMARK - NORWAY 4 HJORRING - ARENDAL 2	1977

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187	JAPAN KYUSHU - IKI - TSUSHIMA	1978
188	JAPAN TSUSHIMA BY-PASS	1978
189	SENEGAL - IVORY COAST "FRATERNITE" DAKAR - ABIDJAN	1978
190	GERMANY, FED. REPUBLIC GROSSENBRODE - BURG	1978
191	GERMANY - SWEDEN 3 GROSSENBRODE - MALMO	1978
192	SPAIN "PENCAN 3" CHIPIONA - LAS PALMAS	1978
193	JAPAN SAGAMI BAY 3 (RETIRED)	1978 (1982)
194	NUMBER UNASSIGNED	
195	FRANCE - MOROCCO 3 "AMITIE" MARSEILLE - TETOUAN	1978
196	PHILIPPINE REPUBLIC - REPUBLIC OF SINGAPORE "PHILSIN" "ASEAN P S" , CURRIMAO - SINGAPORE	1978
197	U.S.S.R. OKHOTSK - NIKOLAYEVSK	1979
198	NUMBER UNASSIGNED	
199	NUMBER UNASSIGNED	
200	NUMBER UNASSIGNED	
201	NUMBER UNASIGNED	
202	JAPAN FUTO - OSHIMA - MIYAKE JIMA	1979
203	FRANCE - U.K. 2 ST VALERIE-EN-CAUX - EASTBOURNE	1979
204	JAPAN MIYAKE JIMA - HACHIJO JIMA	1979
205	LIBYA TRIPOLI - BENGHAZI	1979
206	ITALY GENOA - SASSARI	1979
207	FRANCE - LIBYA "EL FATAH" LA SEYNE - TRIPOLI	1979
208	NUMBER UNASSIGNED	
209	JAPAN - CHINA, REPUBLIC OF "OKITAI" GUSHIKAMI - TOUCHENG	1979
210	SPAIN - ITALY 4 "BARGEN" BARCELONA - GENOA	1979
211	NUMBER UNASSIGNED	
212	JAPAN SAGAMI BAY 4	1979
213	FRANCE - PORTUGAL "TAGIDE" PENMARC'H - SESIMBRA	1979
214	U.K. - NETHERLANDS 10 LOWESTOFT - ALKMAAR	1979
215	FRANCE - ALGERIA 4 MARTIGUES - EL DJEMILA	1980
216	BRAZIL - U.S. "BRUS" FORTALEZA - ST THOMAS	1980
217	U.S. - VENEZUELA 2 ST THOMAS - CAMURI	1980
218	JAPAN SAKURAI - HAKATA	1980
219	JAPAN KUSHIKINO - NAKAKOSHIKI	1980
220	CHINA, REPUBLIC OF - PHILIPPINE REPUBLIC "TAILU" TOUCHENG - CURRIMAO	1980
221	DENMARK - U.K. 3 ROMO - WINTERTON	1980
222	INDONESIA - SINGAPORE "ASEAN I S" JAKARTA - SINGAPORE	1980
223	MALAYSIA KUANTAN - KUCHING	1980
224	JAPAN KAKIDOMARI - FUKUE	1980
225	UNITED KINGDOM LOCH FYNE SEA TRIAL, FIBER OPTIC	1980
226	JAPAN NTTPC FIRST TRIAL, FIBER OPTIC INATORI - KAWAZU	1980
227	JAPAN NAGAHAMA - HIGASHINO	1980
228	JAPAN NASE - TOKUNOSHIMA	1980
229	SPAIN - U.K. 3 RODILES - LANDS END	1980
230	IVORY COAST - NIGERIA ABIDJAN - LAGOS	1980
231	JAPAN UENO - TOURI	1981
232	JAPAN - KOREA HAMADA - PUSAN	1981
233	INDIA - MALAYSIA "IOCOM" MADRAS - PENANG	1981
234	SYRIA - GREECE "PALMYRA" TARTOUS - HERAKLION	1981
235	JAPAN KAGOSHIMA - YAKUSHIMA	1981
236	GREECE - CYPRUS "APOLLO" LAGONISSI - LARNAKA	1981
237	FRANCE - GREECE 2 "ARTEMIS" LA SEYNE - LEKHAINA	1981
238	U.S.(GUAM) - CHINA, REP OF "TAIGU" AGANA - TOUCHENG	1981
239	JAPAN NTTPC FIRST SEA TRIAL SAGAMI BAY, FIBER OPTIC	1981
240	JAPAN NAHA - MIYAKO JIMA	1982
241	ITALY PALERMO - CAGLIARI	1982
242	JAPAN KDD FIRST SEA TRIAL, FIBER OPTIC	1982
243	JAPAN NTTPC FIELD RESEARCH, FIBER OPTIC	1982
244	UNITED STATES AT&T FIRST SEA TRIAL, FIBER OPTIC	1982
245	U.K. - CHANNEL ISLES 6	1982
246	PORTUGAL - SENEGAL - BRAZIL "ATLANTIS" LAGOS - DAKAR - RECIFE	1982
247	FRANCE CAGNES-SUR-MER - JUAN-LES-PINS, FIBER OPTIC	1982
248	DENMARK - NETHERLANDS 4 ROMO - LEEUWARDEN	1983
249	FRANCE - TUNISIA 3 "DIDON" MARTIGUES - BIZERTE	1983
250	UNITED STATES FLORIDA - ST THOMAS 3	1983
251	MALAYSIA - SINGAPORE - THAILAND "ASEAN M-S-T" KUANTAN - KATONG - SONGKHLA - PHETCHABURI	1983

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252	MOROCCO - PORTUGAL "ATLAS" ASILAH - BURGAU	1983
253	JAPAN KAGOSHIMA - NAZE	1983
254	EGYPT - GREECE "ALEXANDROS" ALEXANDRIA - LAGONISSI	1983
255	U.S. - U.K. "TAT 7" TUCKERTON - LANDS END	1983
256	UNITED KINGDOM DEEP SEA TRIALS, FIBER OPTIC	1983
257	UNITED KINGDOM LARNE - PORT PATRICK	1983

Sometimes the amount of cable to be laid for a given project is more than can be accommodated by even the largest cable-layers. Moreover, when the project site is, as frequently the case, half-way round the world from the cable manufacturing plant, it becomes worthwhile to arrange for special services by a freighter modified to act as a cable transporter. Here LONG LINES, upper right, is seen receiving cable from a transport ship at San Francisco in preparation for laying the second segment of Transpacific No. 2.

Cableship PETER FABER belongs to the government of Denmark. The third Danish cableship of the same name, she commemorates the notable Dane of that name who served as head of the post and telegraph administration in the late 1800s. A glance at the map of cables in the North Sea will make it clear immediately why Britain, the Netherlands, and Denmark all have several cable repair ships. PETER FABER (3) is modern in all respects, a capable ship with many advanced features.

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From the List commencing on page 39 the geographic data fields of each of the systems have been dissected, alphabetized, and cross-listed in the following index.

To use the index it is necessary only to know and enter with one word, for example "Italy", to find, in alphabetic order, all systems that serve Italy. Terminal station locations, landing points, and acronyms as well as names of countries are listed and cross-listed also.

The index is not intended for browsing, since space limitations prevent the inclusion of additional identification of a system listing under a given word. For instance, finding the entry "Catania-Khaniá" will give the system reference number which can then be found with more details, either in the List or in the Seacable System Data Profiles.

Thus the index is not cluttered with further identification of the system between Catania and Khaniá by any additional identification of the link as Sicily-Crete or Italy-Greece at that location. Of course the index will give the proper identification, i.e., the system reference number or numbers, by entering with any of the words Sicily, Crete, Italy, or Greece.

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ACRONYMS; SYSTEM NAMES	SYSTEM REFERENCE NUMBER
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TPC 1	68
2	153
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V

W

SEACABLE SYSTEM DATA PROFILES

Definitions of Terms

The format in which the data are presented in the following section has been designed to provide information most useful to the scholar and engineer concerned with the study of world telecommunications technology and economics.

Definitions of the data items follow here; definitions of terms in general will be found in the glossary at the end of the book.

Official Name of the System

The name generally used by the owners of the system, or the name taken from List of Cables Forming the World Submarine Network, the official publication of the International Telecommunications Union, Geneva, or, in the absence of these, the name descriptive of the system in geographical terms.

System Reference Number

Assigned from the data bank of the contractor for this publication, in which numbers are generally in chronological order.

Acronym

As found in the above-named List, or as generally used by the owners

Other Names

Other names are mentioned if in common use and if thought to be helpful to the reader.

Country

The name of the nation or other political entity in whose territory the cable lands.

Terminus

The name of the location of the cable terminal station (where the transmission frequencies are derived and from where system power is fed). The "A" terminus is that from which the lower band of transmission frequencies is sent in a bidirectional coaxial analog system. In the case of multi-link systems the A termini are named in the remarks.

Landing Point

The name of the place at which the cable comes ashore, if different from the terminus.

Coordinates

The latitude and longitude of the landing.

Owner

The name appearing in the before-mentioned List, or as otherwise determined by the contractor for this publication.

I. R. U. Holders

The names of the holders of Indefeasible Rights of Use. To the extent consistent with available space, abbreviations have been avoided, but when abbreviations appear whose meanings are not readily evident , they may be found in the list of abbreviations at the end of the data profiles.

Circuits Held

The number of circuits held by the owner(s) for his or their own services, or by I. R. U. holders. Circuits held plus circuits leased equal total circuits. The letter "h" denotes half-circuit, representing a one-half interest in the cost of a cable circuit from terminal to terminal.

Lessees

The names of the lessees of circuits.

Circuits Leased

The number of circuits leased.

Date in Service

The year in which the system in its current (1984) configuration was placed into operation.

Date of Retirement

The year in which the system ceased operation.

Nature of Service

Whether commercial, military, experimental, or whatever, as designated by the owner or generally understood in the telecommunications community.

Cable Miles

The length of the cable from terminus to terminus, in miles of 6087 feet.

Single or Twin

Whether one bi-directional or two uni-directional cable were used, in the case of the older analog coaxial cable systems.

Number of Equalizers

The number of submerged equalizers in analog coaxial systems.

Equalization Method

Brief description of equalization procedures during cable laying.

Nominal Voice-Circuit Capacity, Non-TASI, as Originally Configured

The number of voice circuits capable of being transmitted at the time of the initiation of service.

Channel Spacing, Initial

The spacing in kiloHertz between channel carriers at time of placing into service.

Terminal Equipment Manufacturer

The name of the entity or entities producing the major portions of the cable system terminal equipment.

Construction Contractor

The name of the entity who had the responsibility to the owners for the satisfactory execution of the whole project and for the guaranteed electrical performance of the system when completed; a "turnkey" or prime contractor, or one of a group of owners acting for the group, or a sole owner acting for himself.

Power Feed Mode

Whether fed from one or both ends.

Nominal Voltage

The value of the DC potential difference from end to end, expressed as a single number for single-end feed, and as a two-part number for double-end feed.

System Current

The value of the current fed to the system.

TASI

If applied, the designation of the TASI system, the number of circuits to which it is applied, and the number of circuits obtained from the TASI application, the total number of circuits available for traffic, and the year in which TASI was applied.

System Type

The designation given by the system designer or the designation of the repeater type, or other designation generally in use and recognized.

Cableship(s) Used

Name(s) of the principal cableship(s) used for the installation. Minor auxiliaries or temporarily-improvised cableships are not named.

Cable Description

Description of the "main" or principal portion, as distinct from shallow-water portions or land-cable lengths.

Cable Size

The outside diameter of the dielectric, in the case of coaxials; the outside diameter of the whole cable structure in the case of fiber optic cables.

Cable Manufacturer

the name of the entity or entities producing the major portion of the cable.

Repeater or Regenerator Physical Description

Whether one or a string of containers; whether flexible in the sense of having joints between containers or because of the attachment of the cable by gimbals, or inflexible, in the case of cable attachments without gimbals; unidirectional or bidirectional, and if transistorized, in the case of the older analog systems.

Number of Repeaters or Regenerators

The number of repeaters or regenerators in the system from terminus to terminus.

Repeater or Regenerator Spacing

The nominal, or average, or general cable distance between units.

Repeater or Regenerator Manufacturer

The name of the entity or entities producing all or significant numbers of the submerged electronic units.

Transmission Frequencies

The frequencies assigned for the system transmission bands, in the case of analog systems, expressed in kiloHertz.

Nominal Transmission Bandwidth

The extent in kiloHertz of the A-B and the B-A transmission bands excluding out-of-band pilots and service channels, applicable in instancies of analog systems.

"Transistorized" and "Solid State"

There have been no commercial submarine telephone cable systems placed in service anywhere in the free world using thermionic vacuum tubes since 1973. A transition in usage of terms was made between the 1975 and the 1980 editions of this book, from "transistorized" to "solid state", but the terms may be used interchangeably. Because all submerged electronics are now universally solid-state, this will not be repeated on the data sheets covering systems coming into service since 1980.

Transmission Wavelength (Fiber Optic Systems)

In the case of light-guide fiber-optic systems the nominal wavelength expressed in microns.

Transmission Bit Rate (Fiber Optic Systems)

The nominal digital transmission speed in megabits per second.

Cost

The reasonably-accurate approximation of the cost of the system at the time it was built, in then-current U.S. dollars, shown as "total", and a reasonably-accurate distribution of the total cost among cable, submerged electronics, terminal and power feed equipment, terminal stations (excluding land), and installation.

Cost (Continued)

Precise cost figures are seldom available in published media, but owners and builders will have the most reliable cost data, of course. Sometimes there are reasons for reticence which have been respected.

In some instances in which precise cost data have not been forthcoming, the contractors for this book have generated representative figures based on experience in the industry.

System Design Life

This is shown by the number of years given by some responsible entity (owner, builder, manufacturer) as the design life objective, or the number of years for which the system has been designed for reasonable maintainability, without serious deterioration of cable or submerged electronics, nor serious degradation of transmission performance.

Place Names and Orthography

Place names are generally the English version (i. e., Rome for Roma). Execptions appear in cases of owner preference, or to include widely-known designations. Spelling and usage are intended to follow American idiom.

RETIRED 1951

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **1**

OFFICIAL NAME	Holyhead-Port Erin		
COUNTRY A	United Kingdom (Wales)	COUNTRY B	United Kingdom (Isle of Man)
TERMINUS A	Holyhead	TERMINUS B	Port Erin
LANDING POINT A	Holyhead	LANDING POINT B	Port Erin
COORDINATES A	53°09'N x 04°38'W	COORDINATES B	54°05'N x 04°44'W

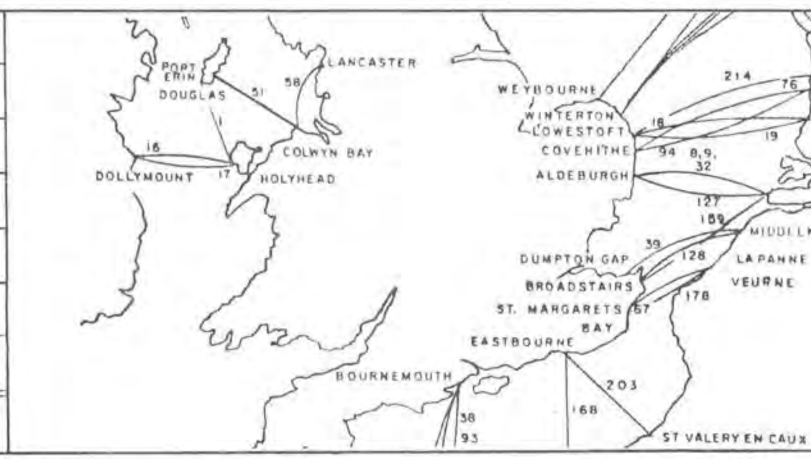
OWNER British Post Office

In 1943 one unidirectional repeater amplifying in the upper band only was inserted in the previously-laid (1937) cable, extending the capacity from 24 to 48 circuits. This project was carried out by cableship IRIS (2).

DATE IN SERVICE	1943	NATURE OF SERVICE	experimental; later commercial	CABLE MILES	44	SINGLE OR TWIN	single
SYSTEM TYPE	A						

- CABLE DESCRIPTION: armored paragutta coaxial — CABLE SIZE: 0.62" 15.7mm
- CABLE MANUFACTURER: Telcon Works, Submarine Cables Limited — CABLESHIP USED: IRIS (2)
- REPEATER DESCRIPTION: monocontainer inflexible asymmestical unidirectional — NUMBER OF REPEATERS: 1 — REPEATER SPACING: -
- REPEATER MANUFACTURER: Siemens Brothers and British Post Office
- NOMINAL TRANSMISSION BANDWIDTH: 192+192kHz — TRANSMISSION FREQUENCIES: 36-228+312-504kHz
- NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -
- NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 48 final 48 — CHANNEL SPACING, INITIAL: 4kHz final 4 kHz
- TERMINAL EQUIPMENT MANUFACTURER: British Post Office — CONSTRUCTION CONTRACTOR: BPO
- POWER FEED MODE: single end — NOMINAL VOLTAGE: 180 V — SYSTEM CURRENT: 0.360 A

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	5 years



RETIRED 1969

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **2**

OFFICIAL NAME	Lowestoft-Borkum		
COUNTRY A	England	COUNTRY B	Federal Republic of Germany
TERMINUS A	Lowestoft, Suffolk	TERMINUS B	Borkum, Isle of Borkum
LANDING POINT A	Lowestoft	LANDING POINT B	Borkum
COORDINATES A	52°29'N x 01°43'E	COORDINATES B	53°37'N x 06°39'E

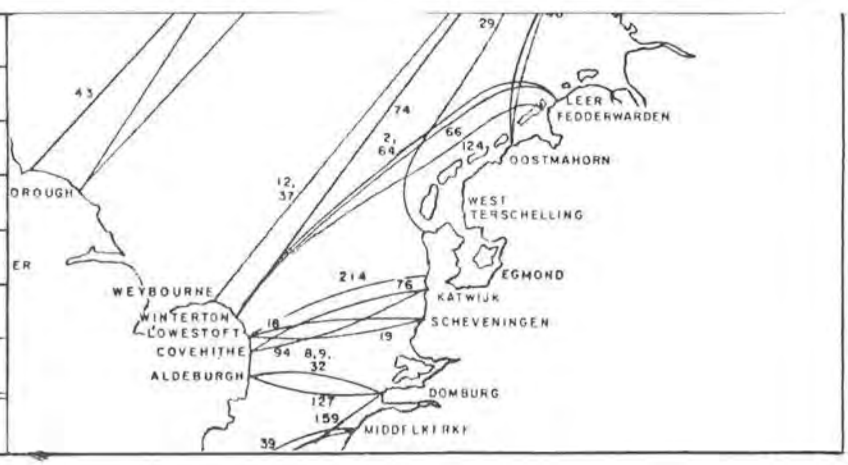
OWNER British Government — CIRCUITS HELD All

In 1946 the previously-laid (1945) voice-frequency multiplex telegraph cable was raised and fitted with a repeater, increasing the capacity from 24 to 120 telegraph channels. In 1969 the system was retired.

DATE IN SERVICE	1946	NATURE OF SERVICE	military	CABLE MILES	197	SINGLE OR TWIN	single	SYSTEM TYPE	B

- CABLE DESCRIPTION: armored polyethylene coaxial — CABLE SIZE 0.62" 15.7mm
- CABLE MANUFACTURER: Submarine Cables Limited — CABLESHIP USED: ALERT (3)
- REPEATER DESCRIPTION: monocontainer inflexible asymmetrical bidirectional — NUMBER OF REPEATERS: 1 — REPEATER SPACING: -
- REPEATER MANUFACTURER: Post Office Laboratories and Siemens Brothers
- NOMINAL TRANSMISSION BANDWIDTH: 20+20 kHz — TRANSMISSION FREQUENCIES: 0-20 + 24-44 kHz
- NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -
- NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 5 final 5 — CHANNEL SPACING, INITIAL: 4 kHz final 4 kHz
- TERMINAL EQUIPMENT MANUFACTURER: Post Office Laboratories — CONSTRUCTION CONTRACTOR: BPO
- POWER FEED MODE: single end — NOMINAL VOLTAGE: 390 V — SYSTEM CURRENT: 0.630 A

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



NOT IN SERVICE

SEACABLE SYSTEM DATA PROFILE

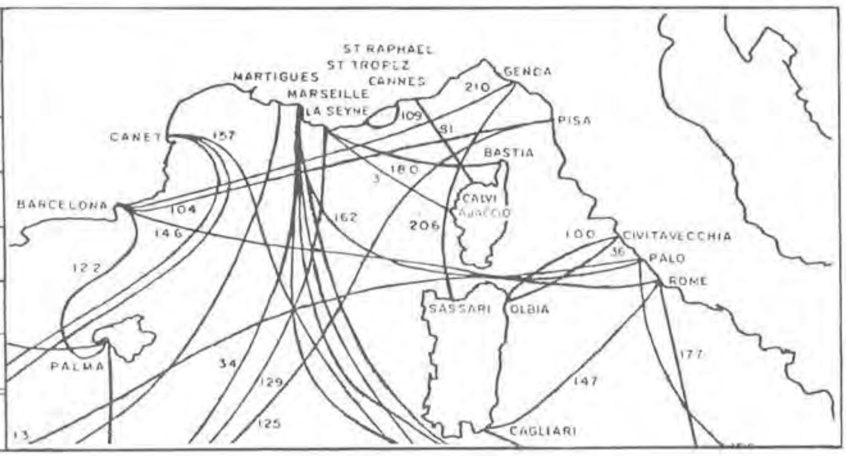
SYSTEM REFERENCE NUMBER **3**

OFFICIAL NAME	Toulon-Ajaccio		
COUNTRY A	France (mainland)	COUNTRY B	France (Corsica)
TERMINUS A	Toulon	TERMINUS B	Ajaccio
LANDING POINT A	La Seyne	LANDING POINT B	Ajaccio
COORDINATES A	$43^{\circ}06'$N x $5^{\circ}52'$E	COORDINATES B	$41^{\circ}55'$N x $8^{\circ}44'$E

OWNER	Administration of Posts and Telecommunications
	In 1946 a repeater was prepared by the Service d'Etudes et de Recherches et des
	Techniques des P. T. T. (S. E. R. T.) for insertion in the previously-laid (1934)
	telegraph cable. After six months of testing in the sea, the repeater was recovered
	for examination and evaluation.

DATE IN SERVICE	1946
NATURE OF SERVICE	experimental
CABLE MILES	180 (est.)
SINGLE OR TWIN	single
CABLE DESCRIPTION	armored guttapercha "59/59"
CABLE MANUFACTURER	Les Câbles de Lyon
CABLESHIP USED	D'ARSONVAL
REPEATER DESCRIPTION	monocontainer inflexible
NUMBER OF REPEATERS	1
REPEATER SPACING	-
REPEATER MANUFACTURER	Cie. Industrielle de Télécommunications CIT
NOMINAL TRANSMISSION BANDWIDTH	
TRANSMISSION FREQUENCIES	
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60
CHANNEL SPACING, INITIAL	
TERMINAL EQUIPMENT MANUFACTURER	CIT
CONSTRUCTION CONTRACTOR	S. E. R. T.
POWER FEED MODE	single end
NOMINAL VOLTAGE	450 V 50 Hz 0.5 A

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



NOT IN SERVICE

SEACABLE SYSTEM DATA PROFILE

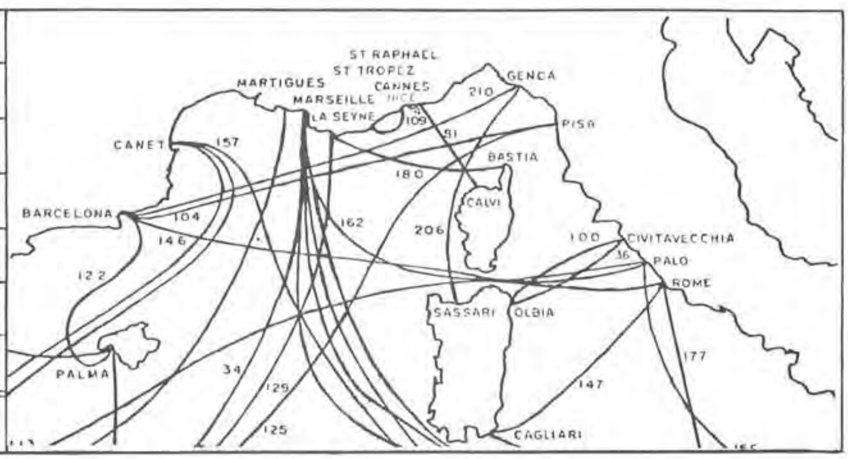
SYSTEM REFERENCE NUMBER **4**

OFFICIAL NAME	Nice-Cannes		
COUNTRY A	France	COUNTRY B	France
TERMINUS A	Nice	TERMINUS B	Cannes
LANDING POINT A	Nice	LANDING POINT B	Cannes
COORDINATES A	43°42'N x 7°16'E	COORDINATES B	43°32'N x 7°03'E

OWNER	Administration of Posts and Telecommunications
	In 1950 an experimental installation consisting of one repeater in a 60-mile cable
	was placed in the Mediterranean with its ends at Nice and Cannes, under the
	direction of the Service d'Etudes et des Recherches et des Techniques (S. E. R. T.)

DATE IN SERVICE	1950	NATURE OF SERVICE	experimental	CABLE MILES	60	SINGLE OR TWIN	single
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.65" 16.6 mm
CABLE MANUFACTURER	Le Câbles de Lyon					CABLESHIP USED	D'ARSONVAL
REPEATER DESCRIPTION	multicontainer articulated flexible bidirectional			NUMBER OF REPEATERS	1	REPEATER SPACING	-
REPEATER MANUFACTURER	Cie. Industrielle de Télécommunications CIT						
NOMINAL TRANSMISSION BANDWIDTH	16 + 16 kHz	TRANSMISSION FREQUENCIES	12-28 + 32-64 kHz				
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	4					CHANNEL SPACING, INITIAL	4
TERMINAL EQUIPMENT MANUFACTURER	CIT					CONSTRUCTION CONTRACTOR	S. E. R. T.
POWER FEED MODE	single end	NOMINAL VOLTAGE	200/200	SYSTEM CURRENT	0.5 A		
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **5**

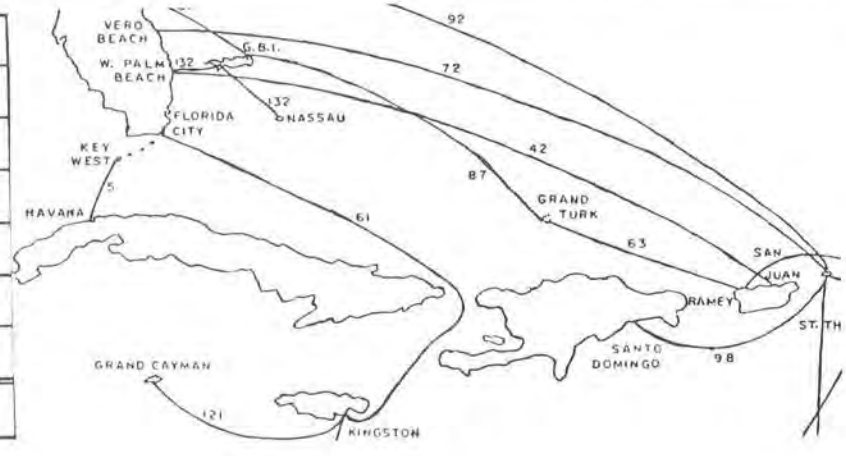
OFFICIAL NAME	Key West-Havana		
COUNTRY A	U.S.A.	COUNTRY B	Cuba
TERMINUS A	Key West, Florida	TERMINUS B	Havana
LANDING POINT A	Key West	LANDING POINT B	El Vedado
COORDINATES A	$24^{o}33'$ N x $81^{o}48'$ W	COORDINATES B	$23^{o}09'$ N x $82^{o}24'$ W

OWNER	Cuban-American Telephone and Telegraph Co.	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	WUI		
CIRCUITS LEASED	1		

DATE IN SERVICE	1950	NATURE OF SERVICE	Commercial	CABLE MILES	119 129	SINGLE OR TWIN	twin	SYSTEM TYPE	SA

CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.46" 11.7 mm
CABLE MANUFACTURER	Simplex Wire & Cable Co.			CABLESHIP USED	LORD KELVIN
REPEATER DESCRIPTION	articulated flexible unidirectional	NUMBER OF REPEATERS	3+3	REPEATER SPACING	40 nm
REPEATER MANUFACTURER	Western Electric Co.				
NOMINAL TRANSMISSION BANDWIDTH	96+96 kHz	TRANSMISSION FREQUENCIES	12-108+12-108 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD			
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	24 now 24	CHANNEL SPACING, INITIAL	4kHz now 4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Co.			CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	single end	NOMINAL VOLTAGE	340	SYSTEM CURRENT	0.230 A
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED	-

COST	$ MILLION
CABLE	1.062
SUBMERGED ELECTRONICS	0.414
TERMINAL AND POWER FEED	0.493
TERMINAL STATIONS	0.171
INSTALLATION	0.238
TOTAL	2.378
SYSTEM DESIGN LIFE	24



BECAME NO. 31 IN 1957

SEACABLE SYSTEM DATA PROFILE

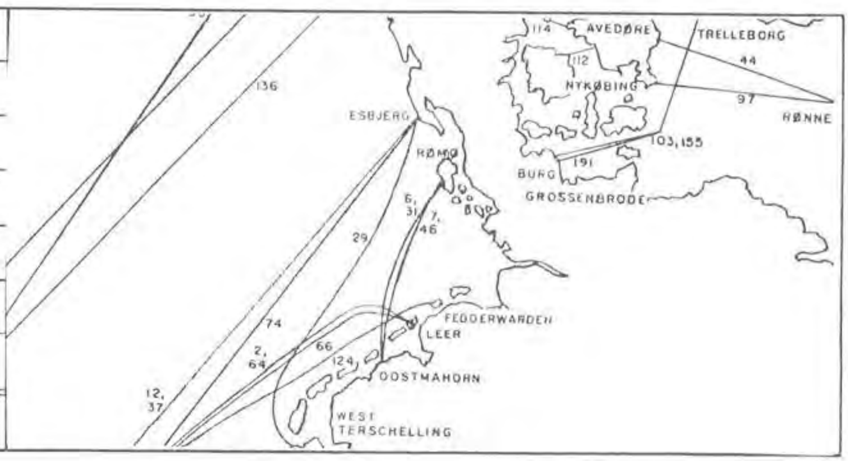
SYSTEM REFERENCE NUMBER **6**

OFFICIAL NAME	Oostmahorn-Rømø 1		
OTHER NAMES	Leeurwarden-Rømø 1		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Leeuwarden	TERMINUS B	Rømø
LANDING POINT A	Oostmahorn	LANDING POINT B	Rømø
COORDINATES A	53°24' N x 06°10'E	COORDINATES B	55°05'N x 08°29'E

OWNER A	Administration of PTT	CIRCUITS HELD	36h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	36h
	In 1957 this system was up-graded by replacing the original two repeaters		
	with 7 of greater capacity, to become System No. 31.		

DATE IN SERVICE	1951	NATURE OF SERVICE	commercial	CABLE MILES	142	SINGLE OR TWIN	single	SYSTEM TYPE	C
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.935" 23.7mm		
CABLE MANUFACTURER	Telegraph Construction & Maintenance Co. Ltd.					CABLESHIPS USED	MONARCH (4) POOLSTER(2) KRARUP(2)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional			NUMBER OF REPEATERS	2	REPEATER SPACING	40nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	144 + 144 kHz	TRANSMISSION FREQUENCIES	24-168 + 208-352 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36			CHANNEL SPACING, INITIAL	4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.			CONSTRUCTION CONTRACTOR	STC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	244/278 V	SYSTEM CURRENT	0.467 A				
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



BECAME NO. 46 IN 1961

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **7**

OFFICIAL NAME	Oostmahorn-Rømø 2		
OTHER NAMES	Leeurwarden-Rømø 2		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Leeurwarden	TERMINUS B	Rømø
LANDING POINT A	Oostmahorn	LANDING POINT B	Rømø
COORDINATES A	53°24'N x 06°10''E	COORDINATES B	55°05'N x 08°29'E

OWNER A	Administration of PTT	CIRCUITS HELD	36h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	36h

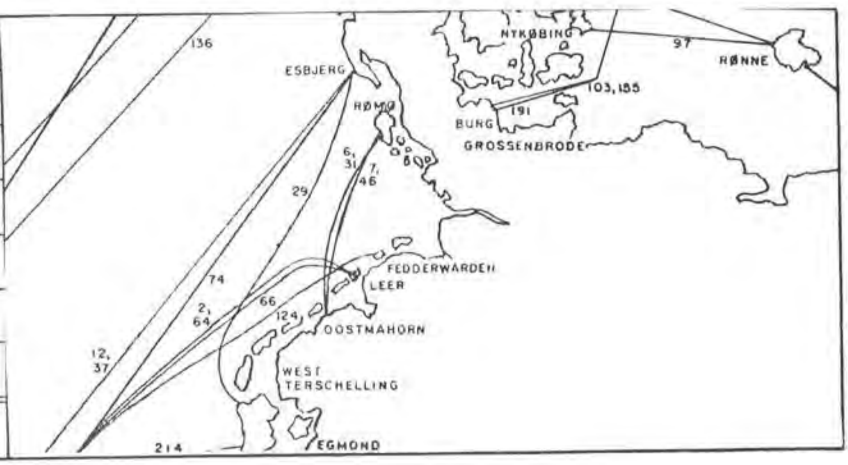
In 1961 this system was up-graded by replacing the original two repeaters with seven of greater capacity, to become System No. 46.

DATE IN SERVICE	1951	NATURE OF SERVICE	commercial	CABLE MILES	143	SINGLE OR TWIN	single	SYSTEM TYPE	C

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.935" 23.7mm
CABLE MANUFACTURER	Telegraph Construction & Maintenance Company Limited		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	2
		REPEATER SPACING	40nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIPS USED	MONARCH (4) POOLSTER(2) C E KRARUP(2)
NOMINAL TRANSMISSION BANDWIDTH	144 + 144 kHz	TRANSMISSION FREQUENCIES	24-168 + 208-352 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36	CHANNEL SPACING, INITIAL	4kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE	244/278
		SYSTEM CURRENT	0.467 A

TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



RETIRED 1972

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **8**

OFFICIAL NAME	Aldeburgh - Domburg 4	ACRONYM	ALD - DOM 4
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Aldeburgh, Suffolk	TERMINUS B	Domberg, Walcharen
LANDING POINT A	Aldeburgh	LANDING POINT B	Domburg
COORDINATES A	52° 10'N x 01°36'E	COORDINATES B	51°34'n x 03° 30'E

OWNER A	British Post Office	CIRCUITS HELD 60h
OWNER B	Administration of PTT	CIRCUITS HELD 60h

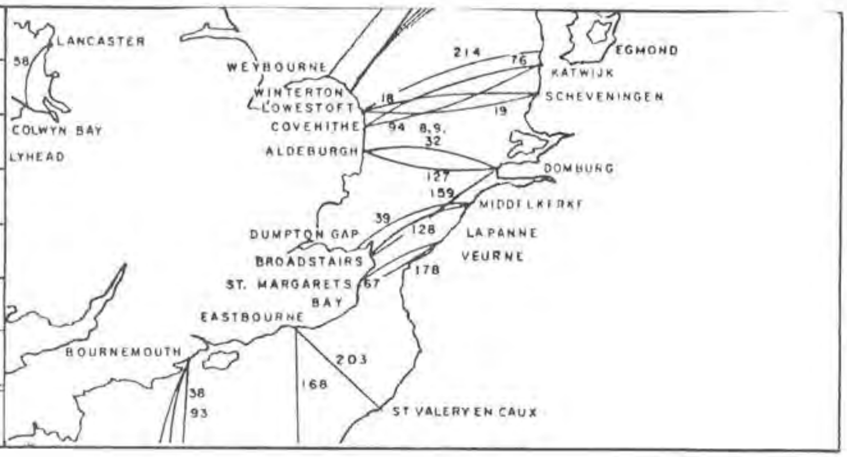
In 1950 the previously-laid (1937) cable was raised by ALERT (2) and 4 2-way repeaters were inserted. Following the installation in 1972 of a new system with 21-supergroup (1260 voice channel) capacity, this system No. 8 was retired.

DATE IN SERVICE	1950	NATURE OF SERVICE	commercial	CABLE MILES	83	SINGLE OR TWIN	single	SYSTEM TYPE	C Mk I

CABLE DESCRIPTION	armored paragutta coaxial	CABLE SIZE	0.62" 15.7mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIP USED	ALERT (3)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	4
		REPEATER SPACING	15.9nm
REPEATER MANUFACTURER	Submarine Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	240 + 240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 final 60	CHANNEL SPACING, INITIAL	4 kHz final 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Siemens Brothers	CONSTRUCTION CONTRACTOR	SCL
POWER FEED MODE	single end	NOMINAL VOLTAGE	1200 V
SYSTEM CURRENT	0.715 A		

TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	0.25
SUBMERGED ELECTRONICS	0.12
TERMINAL AND POWER FEED	0.20
TERMINAL STATIONS	0.20
INSTALLATION	0.05
TOTAL	0.82
SYSTEM DESIGN LIFE	20 years



RETIRED 1972

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **9**

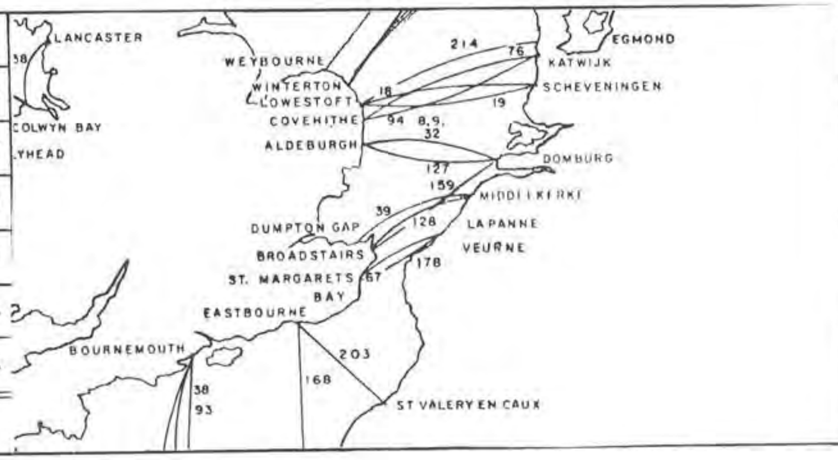
OFFICIAL NAME	Aldeburgh-Domburg 5	ACRONYM	ALD DOM 5
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Aldeburgh, Suffolk	TERMINUS B	Domburg, Walcharen
LANDING POINT A	Aldeburgh	LANDING POINT B	Domburg
COORDINATES A	$52^{\circ}10$ N x $01^{\circ}36$'E	COORDINATES B	$51^{\circ}34$"N x $03^{\circ}30$' E

OWNER A	British Post Office	CIRCUITS HELD	60h
OWNER B	Administration of PTT	CIRCUITS HELD	60h

In 1951 the previously-laid (1937) cable was raised by ALERT (3) and 4 2-way repeaters were inserted. Following the installation in 1972 of a new system with 23-supergroup (1260 voice channel) capacity, this system No. 9 was retired.

DATE IN SERVICE	1951	NATURE OF SERVICE	commercial	CABLE MILES	83	SINGLE OR TWIN	single	SYSTEM TYPE	C Mk I
CABLE DESCRIPTION	armored paragutta coaxial					CABLE SIZE	0.62" 15.7mm		
CABLE MANUFACTURER	Submarine Cables Limited					CABLESHIP USED	ALERT (3)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional			NUMBER OF REPEATERS	4	REPEATER SPACING	15.9nm		
REPEATER MANUFACTURER	Submarine Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	240 + 240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	final	60	CHANNEL SPACING, INITIAL	4 kHz	final	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Siemens Brothers			CONSTRUCTION CONTRACTOR	SCL				
POWER FEED MODE	single end	NOMINAL VOLTAGE	1200 V	SYSTEM CURRENT	0.715 A				
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	0.25
SUBMERGED ELECTRONICS	0.12
TERMINAL AND POWER FEED	0.20
TERMINAL STATIONS	0.01
INSTALLATION	0.05
TOTAL	0.63
SYSTEM DESIGN LIFE	20 years



10)
11) unassigned

BECAME NO. 37 IN 1957

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **12**

OFFICIAL NAME	Weybourne-Fanø		
OTHER NAMES			
COUNTRY A	England	COUNTRY B	Denmark
TERMINUS A	Weybourne, Norfolk	TERMINUS B	Esbjerg
LANDING POINT A	Weybourne	LANDING POINT B	Fanø
COORDINATES A	$52^{\circ}56'$N x $1^{\circ}09'$E	COORDINATES B	$55^{\circ}22'$N x $8^{\circ}25'$E

OWNER	The Great Northern Telegraph Company Limited	CIRCUITS HELD	All

In 1952 two repeaters were installed in the previously-laid (1950) voice frequency multiplex telegraph cable, raising the capacity from 24 to 72 telegraph channels. Then in 1957 the two repeaters were replaced by 5 new ones of greater capacity and the system became No. 37.

DATE IN SERVICE: 1952 | NATURE OF SERVICE: commercial | CABLE MILES: 307 | SINGLE OR TWIN: single | SYSTEM TYPE: B Mk II

CABLE DESCRIPTION: armored polyethylent coaxial | CABLE SIZE: 0.62" 15.7mm

CABLE MANUFACTURER: Submarine Cables Limited | CABLESHIP USED: EDOUARD SUENSON

REPEATER DESCRIPTION: monocontainer inflexible asymmetrical unidirectional | NUMBER OF REPEATERS: 2 | REPEATER SPACING: 75nm

REPEATER MANUFACTURER: Siemens Brothers

NOMINAL TRANSMISSION BANDWIDTH: 12 + 12 kHz | TRANSMISSION FREQUENCIES: 0-12 + 16-28 kHz

NUMBER OF EQUALIZERS: none | EQUALIZATION METHOD: _

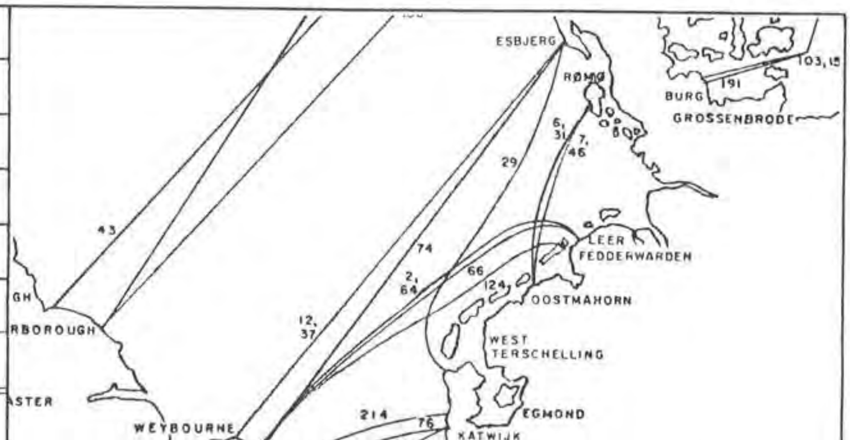
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 3 | CHANNEL SPACING, INITIAL: 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: Siemens Brothers | CONSTRUCTION CONTRACTOR: Siemens Brothers

POWER FEED MODE: single end | NOMINAL VOLTAGE: 1500 | SYSTEM CURRENT: 0.350 A

TASI TYPE: | CIRCUITS USED: | CIRCUITS DERIVED: | TOTAL CIRCUITS: | DATE APPLIED:

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



RETIRED 1972

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **13**

OFFICIAL NAME	Dartmouth-Guernsey 2		
OTHER NAMES	Dartmouth-Fort Doyle		
COUNTRY A	England	COUNTRY B	Channel Isles
TERMINUS A	Dartmouth	TERMINUS B	Fort Doyle
LANDING POINT A	Compass Cove	LANDING POINT B	Fort Doyle
COORDINATES A	50°20'N x 3°34'W	COORDINATES B	49°25'N x 2°32'W

OWNER British Post Office — CIRCUITS HELD All

In 1952 three repeaters were inserted in the previously-laid (1938) cable. Then in 1972 when the new system No. 130 was installed, No. 13 was retired.

DATE IN SERVICE 1952 — NATURE OF SERVICE commercial — CABLE MILES 67 — SINGLE OR TWIN single — SYSTEM TYPE D Mk I

CABLE DESCRIPTION armored paragutta coaxial — CABLE SIZE 0.62" 15.7mm

CABLE MANUFACTURER Submarine Cables Limited — CABLESHIP USED: ALERT (3)

REPEATER DESCRIPTION monocontainer inflexible asymmetrical bidirectional — NUMBER OF REPEATERS 3 — REPEATER SPACING 16.4

REPEATER MANUFACTURER Siemens Brothers Limited

NOMINAL TRANSMISSION BANDWIDTH 240+240 kHz — TRANSMISSION FREQUENCIES 24-264+312-552 kHz

NUMBER OF EQUALIZERS none — EQUALIZATION METHOD -

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 60 — CHANNEL SPACING, INITIAL 4kHz

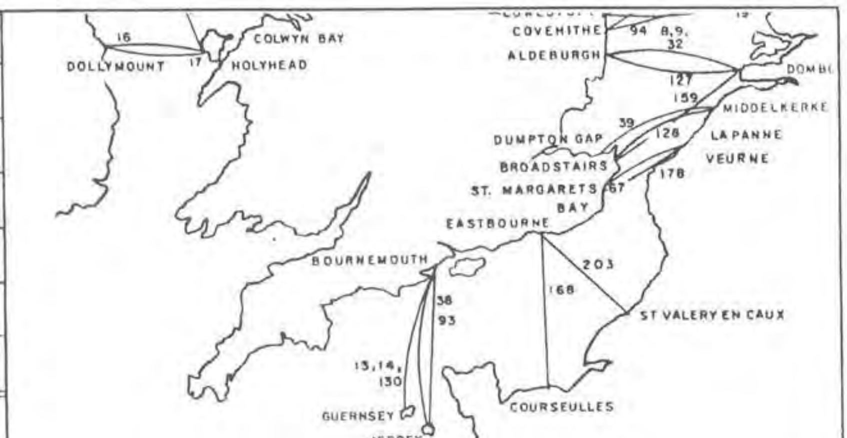
TERMINAL EQUIPMENT MANUFACTURER Siemens Brothers Limited — CONSTRUCTION CONTRACTOR BPO

POWER FEED MODE single end — NOMINAL VOLTAGE 900 V — SYSTEM CURRENT 0.350 A

TASI TYPE — CIRCUITS USED — CIRCUITS DERIVED — TOTAL CIRCUITS — DATE APPLIED

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	

SYSTEM DESIGN LIFE 20 years



RETIRED 1972

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **14**

OFFICIAL NAME	Dartmouth-Guernsey 3		
OTHER NAMES	Dartmouth-Fort Doyle		
COUNTRY A	England	COUNTRY B	Channel Isles
TERMINUS A	Dartmouth	TERMINUS B	Fort Doyle
LANDING POINT A	Compass Cove	LANDING POINT B	Fort Doyle
COORDINATES A	$50^{\circ}20'N \times 3^{\circ}34$ W	COORDINATES B	$49^{\circ}25'N \times 2^{\circ}32'W$

OWNER	Britis Post Office	CIRCUITS HELD	All

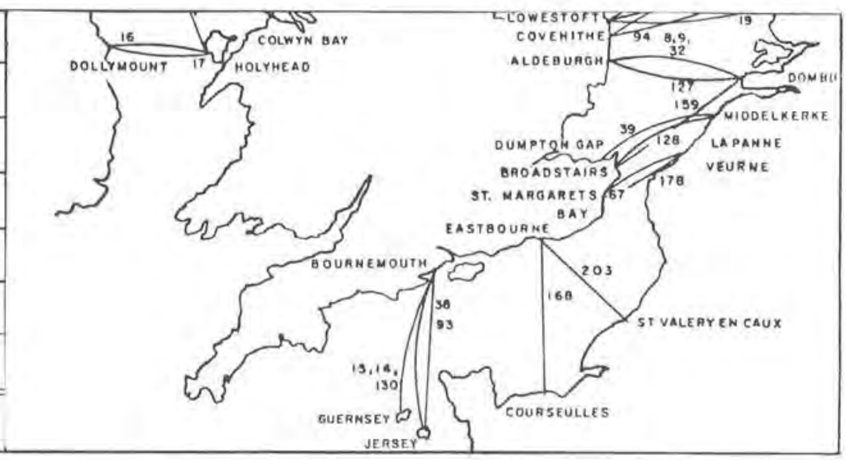
In 1952 three repeaters were inserted in the previously-laid (1940) cable. Then in 1972 when the new system No. 130 was installed, No. 14 was retired.

DATE IN SERVICE	1952	NATURE OF SERVICE	commercial	CABLE MILES	69	SINGLE OR TWIN	single	SYSTEM TYPE	D Mk I

CABLE DESCRIPTION	armored paragutta coaxial	CABLE SIZE	0.62'' 15.7 mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIP USED	ALERT (3)
REPEATER DESCRIPTION	monocontainer inflexible asymmetrical bidirectional	NUMBER OF REPEATERS	3
REPEATER SPACING	16.0 nm		
REPEATER MANUFACTURER	Siemens Brothers Limited		
NOMINAL TRANSMISSION BANDWIDTH	240 + 240 kHz	TRANSMISSION FREQUENCIES	24-264 + 312-552 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Siemens Brothers Limited	CONSTRUCTION CONTRACTOR	BPO
POWER FEED MODE	single end	NOMINAL VOLTAGE	900 V
SYSTEM CURRENT	0.350 A		

TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	20 years



15 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **16**

OFFICIAL NAME	Holyhead- Dublin A		
OTHER NAMES	Dollymount-Holyhead No. 1 Towyn-Dollymount No. 1 Dublin-Holyhead A		
COUNTRY A	United Kingdom (Wales)	COUNTRY B	Irish Republic
TERMINUS A	Holyhead, Holy Is., Wales	TERMINUS B	Dublin
LANDING POINT A	Towyn Bay	LANDING POINT B	Dollymount
COORDINATES A	$53^{o}18'$ N x $4^{o}37'$ W	COORDINATES B	$53^{o}21'$ N x $6^{o}10'$ W

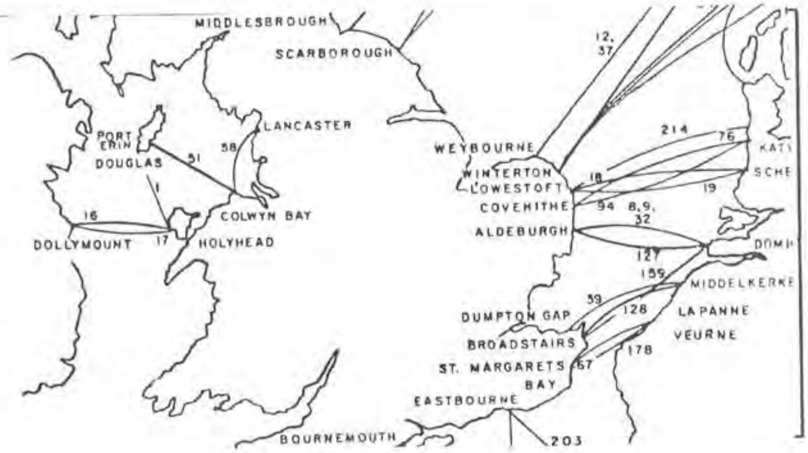
OWNER A	British Post Office	CIRCUITS HELD	60h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	60h
I R U HOLDERS	none		
CIRCUITS HELD	-		
	The 1947 non-repeatered cable was raised and two repeaters installed.		

DATE IN SERVICE	1953	NATURE OF SERVICE	commercial	CABLE MILES	62	SINGLE OR TWIN	single	SYSTEM TYPE	E Mk I

CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Submarine Cables Limited			CABLESHIP USED	ARIEL
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	2	REPEATER SPACING	19 nm
REPEATER MANUFACTURER	Submarine Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	now 60	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Submarine Cables Ltd.			CONSTRUCTION CONTRACTOR	Submarine Cables
POWER FEED MODE	single end	NOMINAL VOLTAGE	600	SYSTEM CURRENT	0.350 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.20
SUBMERGED ELECTRONICS	0.025
TERMINAL AND POWER FEED	0.125
TERMINAL STATIONS	0.010
INSTALLATION	0.005
TOTAL	0.365
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **17**

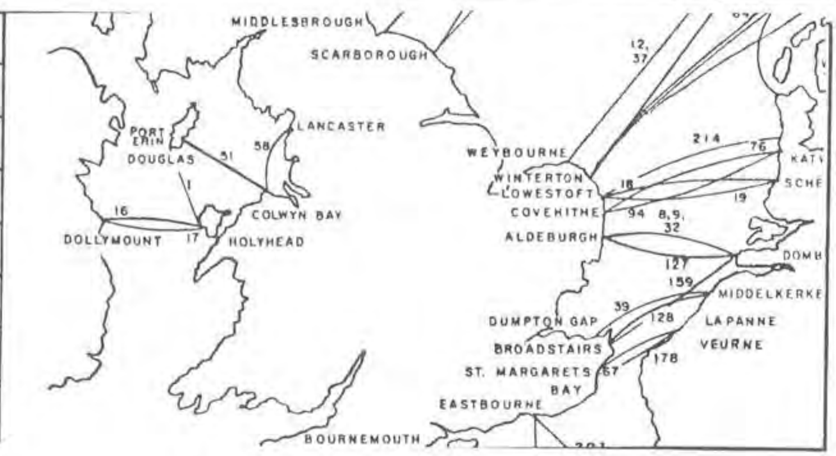
OFFICIAL NAME	Holyhead-Dublin B		
OTHER NAMES	Towyn Bay - Dollymount 2		
COUNTRY A	United Kingdom (Wales)	COUNTRY B	Irish Republic
TERMINUS A	Holyhead, Holy Is., Wales	TERMINUS B	Dublin
LANDING POINT A	Towyn Bay	LANDING POINT B	Dollymount
COORDINATES A	53°18' N x 4° 37' W	COORDINATES B	53°21' N x 6°10' W

OWNER A	British Post Office	CIRCUITS HELD	60h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	60h
I R U HOLDERS	none		
CIRCUITS HELD	–		

The 1947 non-repeatered cable was raised and two repeaters installed.

DATE IN SERVICE	1953	NATURE OF SERVICE	commercial	CABLE MILES	63	SINGLE OR TWIN	single	SYSTEM TYPE	F Mk I
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.62" 15.7 mm		
CABLE MANUFACTURER	Submarine Cables Limited					CABLESHIP USED	ARIEL		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional			NUMBER OF REPEATERS	2	REPEATER SPACING	19 nm		
REPEATER MANUFACTURER	Submarine Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	now 60	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Submarine Cables Ltd.	CONSTRUCTION CONTRACTOR	Submarine Cables						
POWER FEED MODE	single end	NOMINAL VOLTAGE	600	SYSTEM CURRENT	0.350 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.200
SUBMERGED ELECTRONICS	0.025
TERMINAL AND POWER FEED	0.125
TERMINAL STATIONS	0.010
INSTALLATION	0.005
TOTAL	0.365
SYSTEM DESIGN LIFE	20 years



RETIRED 1977

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **18**

OFFICIAL NAME	Lowestoft-Scheveningen No. 1		
OTHER NAMES	Lowestoft-Scheveningen A		
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Lowestoft, Suffolk	TERMINUS B	Scheveningen, South Holland
LANDING POINT A	Lowestoft	LANDING POINT B	Scheveningen
COORDINATES A	$52^{o}29'$ N x $1^{o}45'$ E	COORDINATES B	$52^{o}5'$ N x $4^{o}14'$ E

OWNER A	British Post Office	CIRCUITS HELD	60 h
OWNER B	Administration of PTT	CIRCUITS HELD	60 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1954	NATURE OF SERVICE	commercial	CABLE MILES	97	SINGLE OR TWIN	single	SYSTEM TYPE	E Mk II

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Telegraph Construction and Maintenance Company		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	4
		REPEATER SPACING	18.8 nm
REPEATER MANUFACTURER	Siemens Brothers Limited	CABLESHIPS USED	ARIEL IRIS(2) POOLSTER(2)
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 final 60	CHANNEL SPACING, INITIAL	4 kHz final 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Siemens Brothers Limited	CONSTRUCTION CONTRACTOR	BPO

POWER FEED MODE	single end	NOMINAL VOLTAGE	1200	SYSTEM CURRENT	0.350 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.32
SUBMERGED ELECTRONICS	0.14
TERMINAL AND POWER FEED	0.22
TERMINAL STATIONS	0.23
INSTALLATION	0.05
TOTAL	0.96
SYSTEM DESIGN LIFE	20 years

RETIRED 1977

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **19**

OFFICIAL NAME	Lowestoft-Scheveningen No. 2		
OTHER NAMES	Lowestoft-Scheveningen B		
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Lowestoft, Suffolk	TERMINUS B	Scheveningen, South Holland
LANDING POINT A	Lowestoft	LANDING POINT B	Scheveningen
COORDINATES A	52°29' N x 1°45' E	COORDINATES B	52° 5'N x 4°14' E

OWNER A	British Post Office	CIRCUITS HELD	60 h
OWNER B	Administration of PTT	CIRCUITS HELD	60 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1954 | NATURE OF SERVICE commercial | CABLE MILES 97 | SINGLE OR TWIN single | SYSTEM TYPE E Mk II

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.62" 15.7 mm

CABLE MANUFACTURER Telegraph Construction and Maintenance Company

REPEATER DESCRIPTION monocontainer inflexible bidirectional | NUMBER OF REPEATERS 4 | REPEATER SPACING 18.8 nm

REPEATER MANUFACTURER Siemens Brothers Limited | CABLESHIPS USED ARIEL IRIS (2) POOLSTER (2)

NOMINAL TRANSMISSION BANDWIDTH 240+240 kHz | TRANSMISSION FREQUENCIES 24-264+312-552 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD -

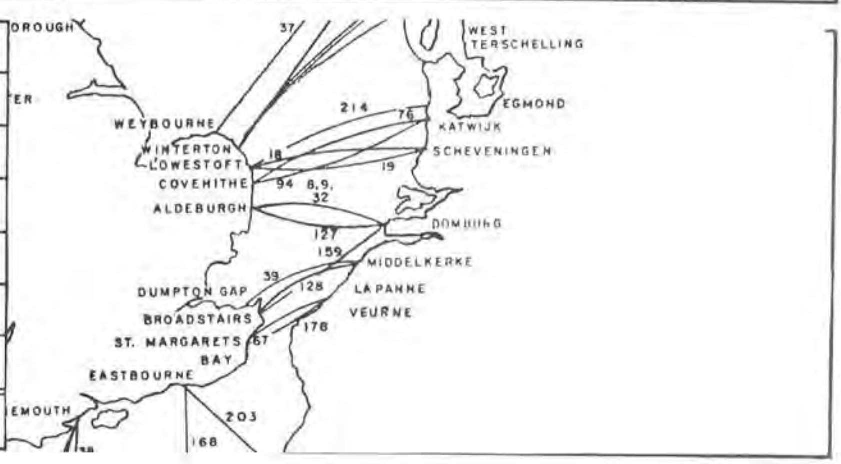
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 60 final 60 | CHANNEL SPACING, INITIAL 4 kHz final 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Siemens Brothers Limited | CONSTRUCTION CONTRACTOR BPO

POWER FEED MODE single end | NOMINAL VOLTAGE 1200 | SYSTEM CURRENT 0.350 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	0.32
SUBMERGED ELECTRONICS	0.14
TERMINAL AND POWER FEED	0.22
TERMINAL STATIONS	0.01
INSTALLATION	0.05
TOTAL	0.74
SYSTEM DESIGN LIFE	20 years



RETIRED 1982

SEACABLE SYSTEM DATA PROFILE

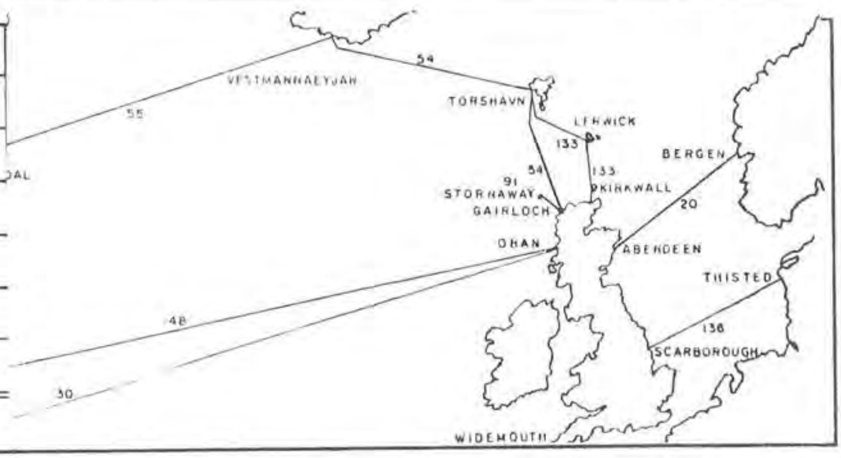
SYSTEM REFERENCE NUMBER **20**

OFFICIAL NAME	Strabathie-Cs		
OTHER NAMES	Aberdeen-Bergen Os-Strabathie A Os-Strabathie No. 1 UK-Norway		
COUNTRY A	U.K. (Scotland)	COUNTRY B	Norway
TERMINUS A	Strabathie	TERMINUS B	Bergen
LANDING POINT A	Strabathie	LANDING POINT B	Os
COORDINATES A	57°12' N x 2°04' W	COORDINATES B	60°10' N x 4°25' E

OWNER A	British Post Office	CIRCUITS HELD	36 h
OWNER B	Telecommunications Administration	CIRCUITS HELD	36 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1954
NATURE OF SERVICE	mixed
CABLE MILES	307
SINGLE OR TWIN	single
SYSTEM TYPE	G Mk I
CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Submarine Cables Limited
CABLESHIP USED	MONARCH (4)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	7
REPEATER SPACING	38.9 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	144+144 kHz
TRANSMISSION FREQUENCIES	24-168+208-352 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36 now 36
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Tel. & Cables Ltd.
CONSTRUCTION CONTRACTOR	Submarine Cables
POWER FEED MODE	double end
NOMINAL VOLTAGE	550/550
SYSTEM CURRENT	0.311 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	1.39
SUBMERGED ELECTRONICS	0.26
TERMINAL AND POWER FEED	0.24
TERMINAL STATIONS	0.25
INSTALLATION	0.16
TOTAL	2.30
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

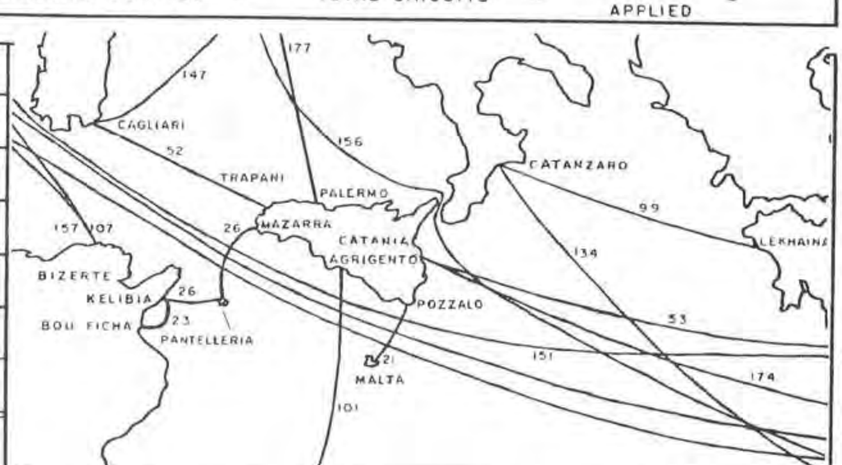
SYSTEM REFERENCE NUMBER **21**

OFFICIAL NAME	Sicily - Malta		
OTHER NAMES	St. Georges - Pozzallo	MED 1	
COUNTRY A	Malta	COUNTRY B	Italy (Sicily)
TERMINUS A	St. Georges	TERMINUS B	Pozzallo
LANDING POINT A	St. Georges	LANDING POINT B	Pozzallo
COORDINATES A	35°55' N x 14°30' E	COORDINATES B	36°49' N x 14°53' E

OWNER A	TeleMalta Corporation	CIRCUITS HELD	48h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	48h
I R U HOLDERS	none		
CIRCUITS HELD	- none		
LESSEES	Various		
CIRCUITS LEASED	- 2		

DATE IN SERVICE	1955	NATURE OF SERVICE	commercial	CABLE MILES	53	SINGLE OR TWIN	single	SYSTEM TYPE	G Mk I
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Submarine Cables Limited			CABLESHIP USED	ARIEL				
REPEATER DESCRIPTION	monocontainer inflexible bidirectional			NUMBER OF REPEATERS	1			REPEATER SPACING	-
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	144+144 kHz	TRANSMISSION FREQUENCIES	24-168+208-352 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36	now 48		CHANNEL SPACING, INITIAL	4 kHz	now 3 kHz			
TERMINAL EQUIPMENT MANUFACTURER	Standard Tel. & Cables Ltd.			CONSTRUCTION CONTRACTOR	Submarine Cables				
POWER FEED MODE	single end	NOMINAL VOLTAGE	200	SYSTEM CURRENT	0.467 A				
TASI TYPE - CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	0.156
SUBMERGED ELECTRONICS	0.036
TERMINAL AND POWER FEED	0.235
TERMINAL STATIONS	0.240
INSTALLATION	0.120
TOTAL	0.787
SYSTEM DESIGN LIFE	20 years



22 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **23**

OFFICIAL NAME	Kelibia-Bou Ficha		
OTHER NAMES			
COUNTRY A	Tunisia	COUNTRY B	Tunisia
TERMINUS A	Kelibia	TERMINUS B	Bou Ficha
LANDING POINT A	Kelibia	LANDING POINT B	Bou Ficha
COORDINATES A	36°51' N x 11°6' E	COORDINATES B	36°18' N x 10°27' E

OWNER	Administration of PTT	CIRCUITS HELD	all
I R U HOLDERS	None		
CIRCUITS HELD			
LESSEES	None		
CIRCUITS LEASED			

DATE IN SERVICE 1956 | NATURE OF SERVICE commercial | CABLE MILES 59 | SINGLE OR TWIN single | SYSTEM TYPE F 120

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.65" 16.6 mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIPS USED IRIS (2), AMPERE (3)

REPEATER DESCRIPTION monocontainer flexible bidirectional | NUMBER OF REPEATERS 4 | REPEATER SPACING 14 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications

NOMINAL TRANSMISSION BANDWIDTH 492+492 kHz | TRANSMISSION FREQUENCIES 60-552+672-1164 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD -

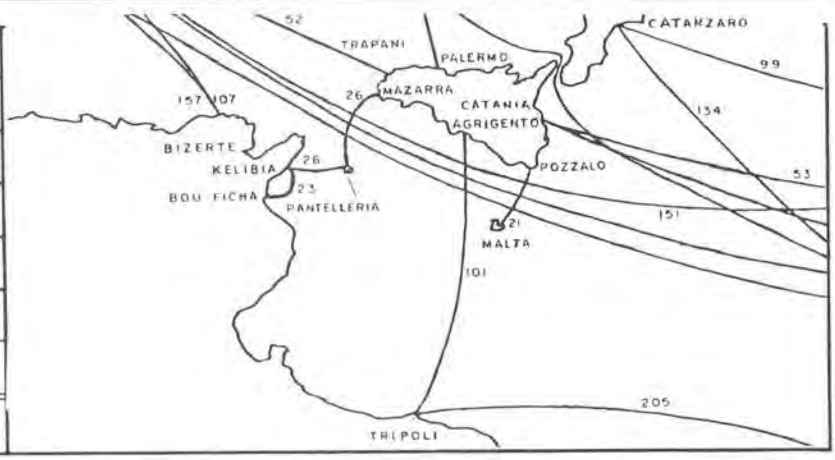
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 now 120 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT | CONSTRUCTION CONTRACTOR CIT

POWER FEED MODE single end | NOMINAL VOLTAGE 450 | SYSTEM CURRENT 0.445 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	0.19
SUBMERGED ELECTRONICS	0.18
TERMINAL AND POWER FEED	0.23
TERMINAL STATIONS	0.25
INSTALLATION	0.05
TOTAL	0.90
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **24**

OFFICIAL NAME	Kristiansand-Thisted 1		
OTHER NAMES			
COUNTRY A	Norway	COUNTRY B	Denmark
TERMINUS A	Kristiansand	TERMINUS B	Thisted, Thy
LANDING POINT A	Kristiansand	LANDING POINT B	Hantsholm
COORDINATES A	$58^{\circ}10'$ N x $08^{\circ}01'$ E	COORDINATES B	$57^{\circ}07'$ N x $8^{\circ}35'$ E

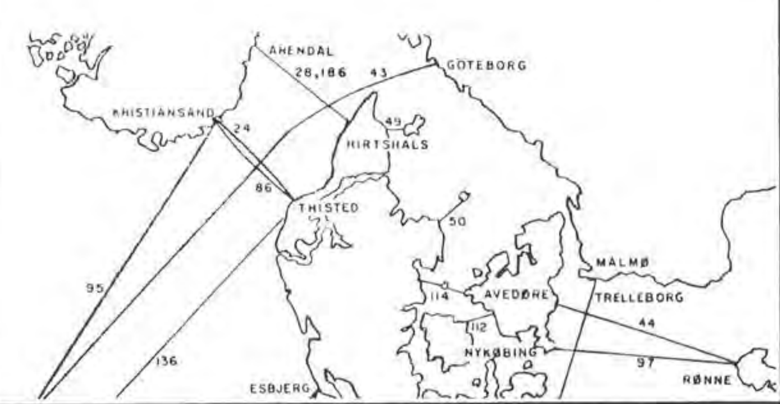
OWNER A	Administration of Telecommunications	CIRCUITS HELD	60 h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	60 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1956	NATURE OF SERVICE	commercial	CABLE MILES	69	SINGLE OR TWIN	single	SYSTEM TYPE	H Mk 1

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.935" 23.7 mm		
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIPS USED	OCEAN LAYER, C E KRARUP (2)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	2	REPEATER SPACING	22 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	now 60	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz	
TERMINAL EQUIPMENT MANUFACTURER	STC	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	single	NOMINAL VOLTAGE	350	SYSTEM CURRENT	0.310 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.29
SUBMERGED ELECTRONICS	0.07
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	0.27
INSTALLATION	0.09
TOTAL	0.97
SYSTEM DESIGN LIFE	20 years

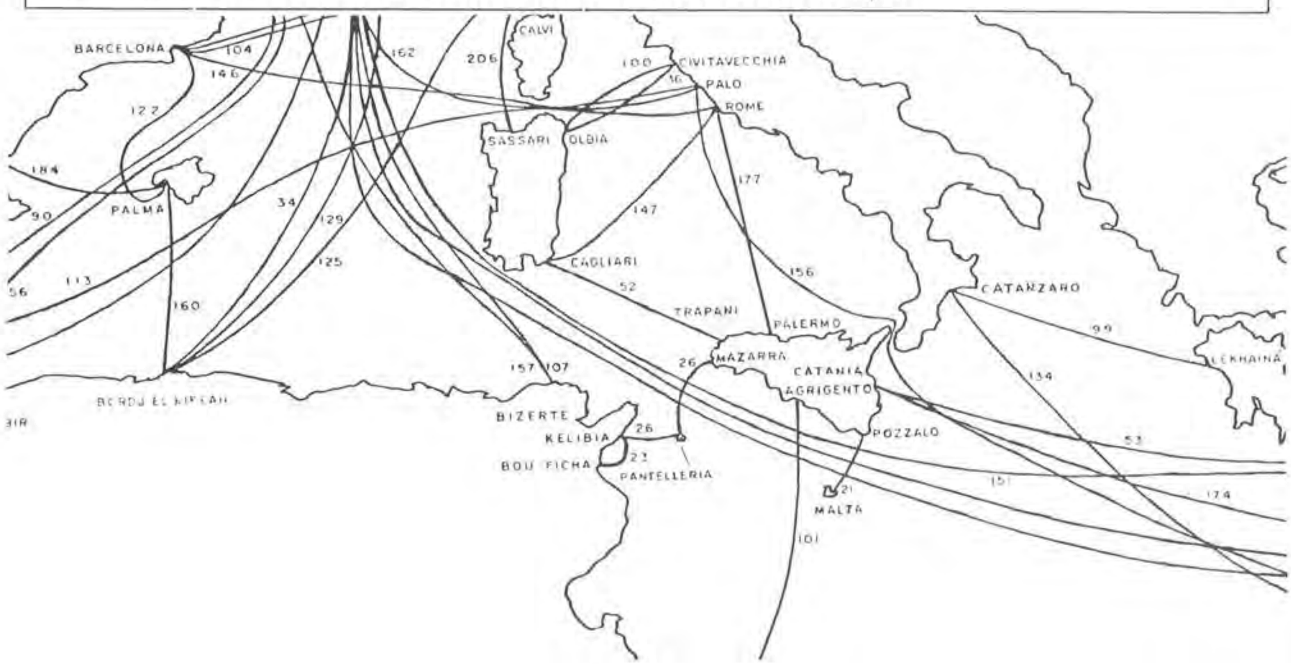


SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **26**

OFFICIAL NAME	Italy-Tunisia		
OTHER NAMES	Mazara-Pantelleria-Kelibia		
COUNTRY A	Italy (Sicily)	COUNTRY B	Italy (Pantelleria)
TERMINUS A	Mazara	TERMINUS B	Pantelleria
LANDING POINT A	Mazara	LANDING POINT B	Pantelleria
COORDINATES A	$38^{o}1'$ N x $12^{o}32'$ E	COORDINATES B	$36^{o}50'$ N x $11^{o}58'$ E
COUNTRY C	Tunisia	COUNTRY D	
TERMINUS C	Kelibia	TERMINUS D	
LANDING POINT C	Kelibia	LANDING POINT D	
COORDINATES C	$36^{o}51'$ N x $11^{o}6'$ E	COORDINATES D	
COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 60	B C 43					
DATE IN SERVICE	1956	NATURE OF SERVICE	military	SINGLE OR TWIN	single	SYSTEM TYPE	EMk I
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Submarine Cables Limited and Les Câbles de Lyon						



OWNERS	Administrations of Posts and Telecommunications
CIRCUITS HELD	All
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	Monocontainer inflexible bidirectional	REPEATER SPACING	19 nm
NUMBER OF REPEATERS	A B 3	B C none	
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd.		
NUMBER OF EQUALIZERS	A B none	B C none	
EQUALIZATION METHOD	-		
TERMINAL EQUIPMENT MANUFACTURER	Compagnie Industrielle de Télécomunications and STC		
POWER FEED MODE	A B single		
NOMINAL VOLTAGE	900	SYSTEM CURRENT	0.350 A
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60, now 60	CHANNEL SPACING, INITIAL	4 kHz, now 4 kHz
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS - DATE APPLIED -
REMARKS	CABLESHIP USED: IRIS (2)		

CONSTRUCTION CONTRACTOR	British Post Office

COST	$ MILLION
CABLE	0.29
SUBMERGED ELECTRONICS	0.11
TERMINAL AND POWER FEED	0.33
TERMINAL STATIONS	0.36
INSTALLATION	0.20
TOTAL	1.29
SYSTEM DESIGN LIFE	20 years

RETIRED 1977

SEACABLE SYSTEM DATA PROFILE

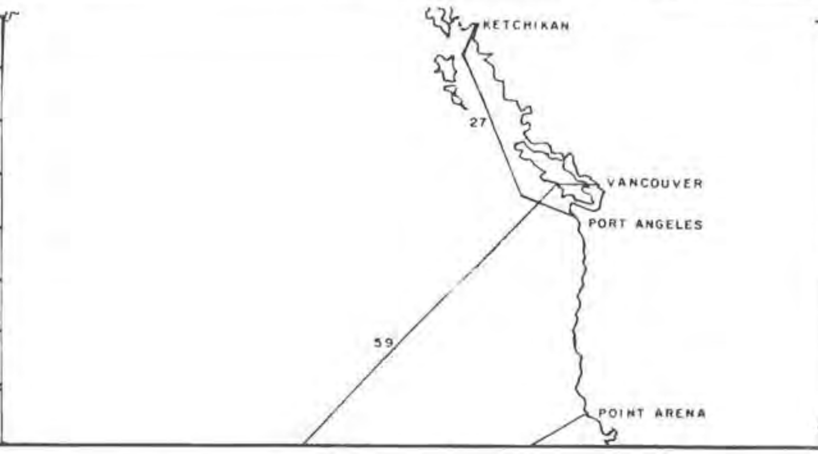
SYSTEM REFERENCE NUMBER **27**

OFFICIAL NAME	Washington-Alaska		
OTHER NAMES	Port Angeles-Ketchikan		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A.
TERMINUS A	Port Angeles, Washington	TERMINUS B	Ketchikan, Alaska
LANDING POINT A	Port Angeles	LANDING POINT B	Ketchikan
COORDINATES A	$48^{o}09'$ N x $123^{o}33'$ W	COORDINATES B	$55^{o}21'$ N x $131^{o}41'$ W

OWNER	American Telephone and Telegraph Company	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1956	NATURE OF SERVICE	commercial	CABLE MILES	761 738	SINGLE OR TWIN	twin	SYSTEM TYPE	SB
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.62" 15.7 mm		
CABLE MANUFACTURER	Simplex Wire & Cable Company			CABLESHIPS USED		ALBERT J MYER BASIL O LENOIR			
REPEATER DESCRIPTION	articulated flexible unidirectional			NUMBER OF REPEATERS	20 19	REPEATER SPACING	38 nm		
REPEATER MANUFACTURER	Western Electric Company								
NOMINAL TRANSMISSION BANDWIDTH	144+144 kHz	TRANSMISSION FREQUENCIES	20-164+20-164 kHz						
NUMBER OF EQUALIZERS	2+2	EQUALIZATION METHOD	adjust cable length; select equalizers						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36	final 48	CHANNEL SPACING, INITIAL	4 kHz	final	3 kHz			
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company		CONSTRUCTION CONTRACTOR	ATT					
POWER FEED MODE	double end	NOMINAL VOLTAGE	1600/1600	SYSTEM CURRENT	0.225 A				
TASI TYPE - CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	10.74
SUBMERGED ELECTRONICS	2.57
TERMINAL AND POWER FEED	0.95
TERMINAL STATIONS	1.14
INSTALLATION	0.80
TOTAL	16.20
SYSTEM DESIGN LIFE	24 years



RETIRED 1979

SEACABLE SYSTEM DATA PROFILE

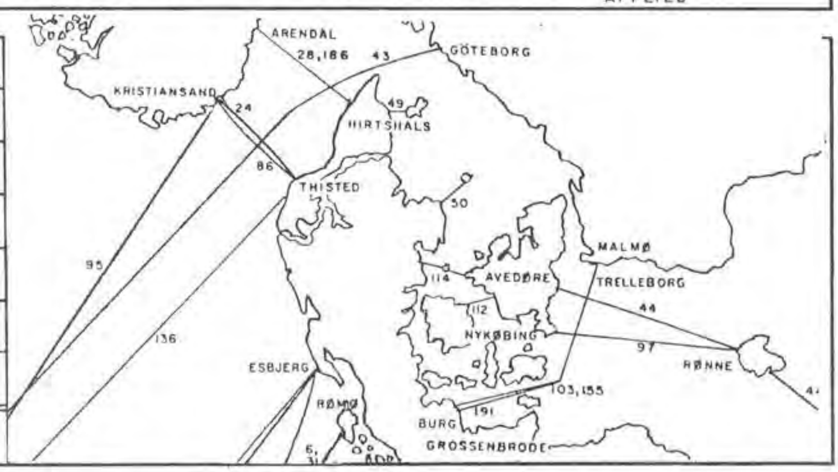
SYSTEM REFERENCE NUMBER **28**

OFFICIAL NAME	Hjørring-Arendal		
OTHER NAMES	Hirtshals-Arendal		
COUNTRY A	Denmark	COUNTRY B	Norway
TERMINUS A	Hjørring, Vendsyssel	TERMINUS B	Arendal
LANDING POINT A	Hirtshals	LANDING POINT B	Arendal
COORDINATES A	57°35' N x 9°57' E	COORDINATES B	58°14' N x 8°22'E

OWNER A	Administration of Posts and Telegraphs	CIRCUITS HELD	60 h
OWNER B	Administration of Telecommunications	CIRCUITS HELD	60 h
	The previuosly-laid polyethylene coaxial cable was raised in three locations		
	and three repeaters were inserted in 1956		

DATE IN SERVICE	1956	NATURE OF SERVICE	commercial	CABLE MILES	76	SINGLE OR TWIN	single	SYSTEM TYPE	Z60S
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.90" 22.9 mm
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG					CABLESHIP USED	NORDENHAM		
REPEATER DESCRIPTION	multicontainer articulated flexible bidirectional					NUMBER OF REPEATERS	3	REPEATER SPACING	22 nm
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG								
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz			TRANSMISSION FREQUENCIES	24-264+312-552 kHz				
NUMBER OF EQUALIZERS	none			EQUALIZATION METHOD	-				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	final	60	CHANNEL SPACING, INITIAL	4 kHz	final	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	F&G Fernmeldeanlagen GmbH			CONSTRUCTION CONTRACTOR	F&G				
POWER FEED MODE	single end	NOMINAL VOLTAGE	400	SYSTEM CURRENT	0.445 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.20
SUBMERGED ELECTRONICS	0.10
TERMINAL AND POWER FEED	0.21
TERMINAL STATIONS	0.23
INSTALLATION	0.09
TOTAL	0.83
SYSTEM DESIGN LIFE	20years



SEACABLE SYSTEM DATA PROFILE

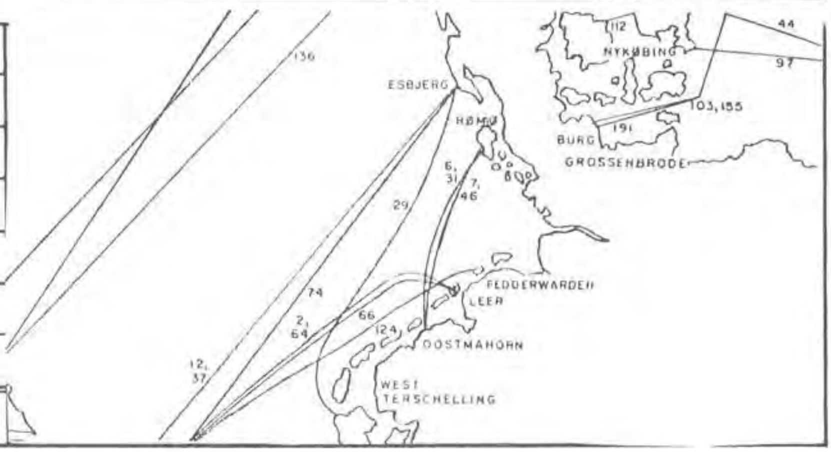
RETIRED 1983
SYSTEM REFERENCE NUMBER **29**

OFFICIAL NAME	Westterschelling- Maade		
OTHER NAMES	Westterschelling-Fanø		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Westterschelling	TERMINUS B	Maade, Jutland
LANDING POINT A	Westterschelling	LANDING POINT B	Fanø
COORDINATES A	53^{o} 19' N x 5^{o}10' E	COORDINATES B	55^{o}22' N x 8^{o}25' E

OWNER A	Administration of PTT	CIRCUITS HELD	60h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	60h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1956	NATURE OF SERVICE	commercial	CABLE MILES	182	SINGLE OR TWIN	single	SYSTEM TYPE	F 60
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.61" 15.6 mm		
CABLE MANUFACTURER	Les Câbles de Lyon			CABLESHIP USED	AMPERE (3)				
REPEATER DESCRIPTION	articulated flexible bidirectional			NUMBER OF REPEATERS	7	REPEATER SPACING	25 nm		
REPEATER MANUFACTURER	Cie. Industrielle de Télécommunications								
NOMINAL TRANSMISSION BANDWIDTH	240+240	TRANSMISSION FREQUENCIES	24-264+312-552 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60	now 60	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Cie. Industrielle de Télécomm.	CONSTRUCTION CONTRACTOR	CIT						
POWER FEED MODE	single end	NOMINAL VOLTAGE	800	SYSTEM CURRENT	0.439 A				
TASI TYPE - CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	0.85
SUBMERGED ELECTRONICS	0.33
TERMINAL AND POWER FEED	0.27
TERMINAL STATIONS	0.32
INSTALLATION	0.12
TOTAL	1.89
SYSTEM DESIGN LIFE	20 years



RETIRED 1978

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **30**

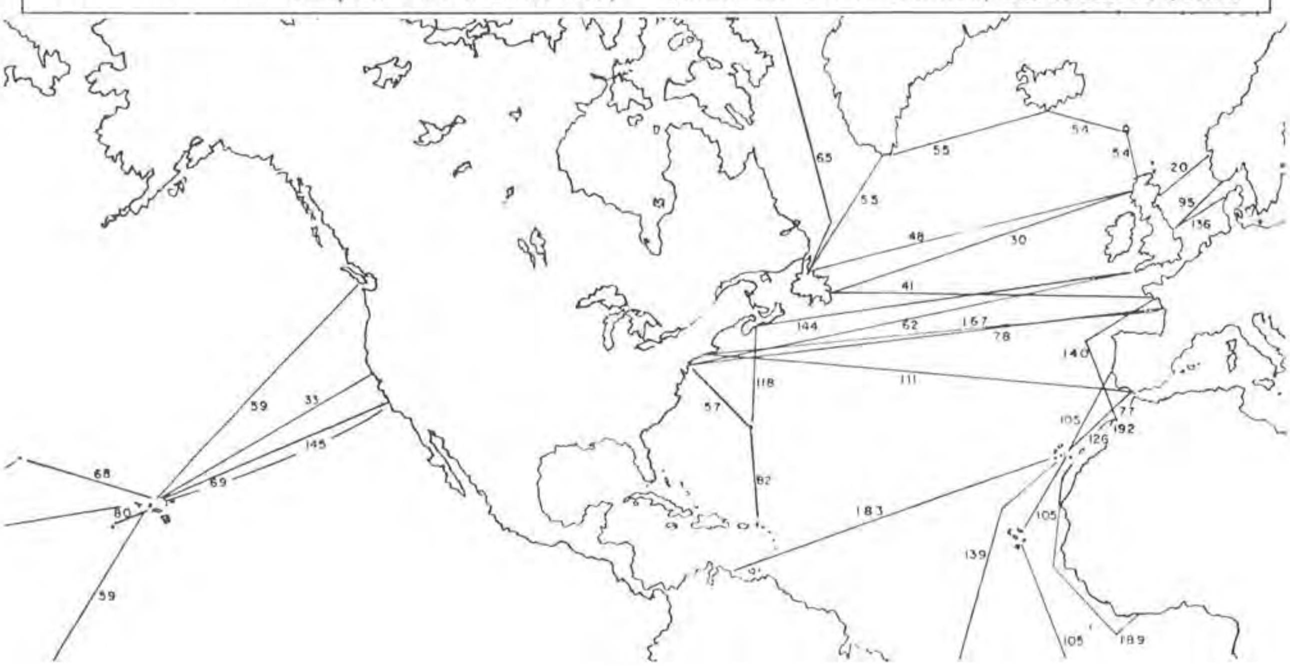
OFFICIAL NAME	Transatlantic No. 1	ACRONYM	TAT-1
OTHER NAMES	Oban-Clarenville-Sydney Mines TAT-1 (E-W)(W-E) Clarenville-Sydney Mines I		

COUNTRY A	United Kingdom	COUNTRY B	Canada
TERMINUS A	Oban, Scotland	TERMINUS B	Clarenville, Newfoundland
LANDING POINT A	Oban	LANDING POINT B	Clarenville
COORDINATES A	56°23' N x 5°31' W	COORDINATES B	48°09' N x 53°57' W

COUNTRY C	Canada	COUNTRY D	Canada
TERMINUS C	Terrenceville, Newfoundland	TERMINUS D	Sydney Mines, Nova Scotia (A)
LANDING POINT C	Terrenceville	LANDING POINT D	Sydney Mines
COORDINATES C	47°40' N x 54°44' W	COORDINATES D	46°16' N x 60°15' W

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB: 1945 BA: 1942	B C 55	C D 271		
DATE IN SERVICE	1956	NATURE OF SERVICE: commercial	SINGLE OR TWIN: AB: twin BCD: single	SYSTEM TYPE: AB: SB BCD: J-Mk I	
CABLE DESCRIPTION	armored polyethylene coaxial		CABLE SIZE 0.62" 15.7 mm		
CABLE MANUFACTURER	Simplex Wire & Cable Co., Submarine Cables Limited, and Southern United				



RETIRED 1978

30
continued

OWNERS	British Post Office	A.T.&T. Co.	*Canadian Overseas Telecommunications Corp.
CIRCUITS HELD	33 h	33 h	9
I R U HOLDERS	ITTWC/ BPO	RCAGC/ BPO	WUI/ BPO
CIRCUITS HELD	2	3	3
LESSEES	ITTWC	RCAGC	
CIRCUITS LEASED	1	1	

REPEATER DESCRIPTION	AB: articulated flexible unidirectional BD: monocontainer inflexible bidirectional — REPEATER SPACING 38 nm / 20 nm
NUMBER OF REPEATERS	AB: 51 BA: 51 — B C 2 — C D 14
REPEATER MANUFACTURER	AB: Western Electric Co. — BD: Standard Telephones & Cables Ltd. Submarine Cables Limited
NUMBER OF EQUALIZERS	AB: 8 BA: 6 — B C none — C D 1
EQUALIZATION METHOD	adjust cable length and select equalizer
TERMINAL EQUIPMENT MANUFACTURER	AB: Western Electric Company BD: Standard Telephones & Cables Limited
POWER FEED MODE	AB: double end — BD: double end
NOMINAL VOLTAGE	1940/1940 — 1150/1150 — SYSTEM CURRENT AB: 0.225A BD: 0.316A
NOMINAL TRANSMISSION BANDWIDTH	AB: 144+144 kHz BD: 240+240 kHz — TRANSMISSION FREQUENCIES 20-164+20-164 kHz 20-260+312-552 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AB: 36 BD: 60 — 1978 50 / 80 — CHANNEL SPACING, INITIAL AB: 4 kHz BD: 4 kHz — 1978 AB: 3 kHz BD: 3 kHz
TASI TYPE	A — CIRCUITS USED 21* — CIRCUITS DERIVED 37 — TOTAL CIRCUITS 74 — DATE APPLIED 1960
REMARKS	*plus 16 circuits from TAT 3 ** includes TASI and TD-2 microwave to U.S. border

CONSTRUCTION CONTRACTOR	AB: A.T.&T. Co. — BD: British Post Office

CABLESHIPS USED:

MONARCH (4)

IRIS (2)

COST	$ MILLION
CABLE	24.89
SUBMERGED ELECTRONICS	8.88
TERMINAL AND POWER FEED	3.70
TERMINAL STATIONS **	10.91
INSTALLATION	1.20
TOTAL	49.58
SYSTEM DESIGN LIFE	24 years

* now Teleglobe Canada

RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **31**

OFFICIAL NAME	Oostmahorn-Rømø No. 1		
OTHER NAMES	Leeuwarden-Rømø No. 1		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Oostmahorn, Friesland	TERMINUS B	Rømø
LANDING POINT A	Oostmahorn	LANDING POINT B	Rømø
COORDINATES A	$53^{\circ}24'$ N x $6^{\circ}10'$ E	COORDINATES B	$55^{\circ}05'$ N x $8^{\circ}29'$ E

OWNER A	Administration of PTT	CIRCUITS HELD	120 h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	120 h

This system was created by installing seven 120-channel repeaters in place of the original two 36-channel repeaters in system No. 6.

DATE IN SERVICE	1957	NATURE OF SERVICE	commercial	CABLE MILES	142	SINGLE OR TWIN	single	SYSTEM TYPE	M Mk I

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIPS USED	ALERT (3) POOLSTER (2)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	7	REPEATER SPACING	20 nm

REPEATER MANUFACTURER: Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH: 492+492 kHz — TRANSMISSION FREQUENCIES: 60-552+672-1164 kHz

NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -

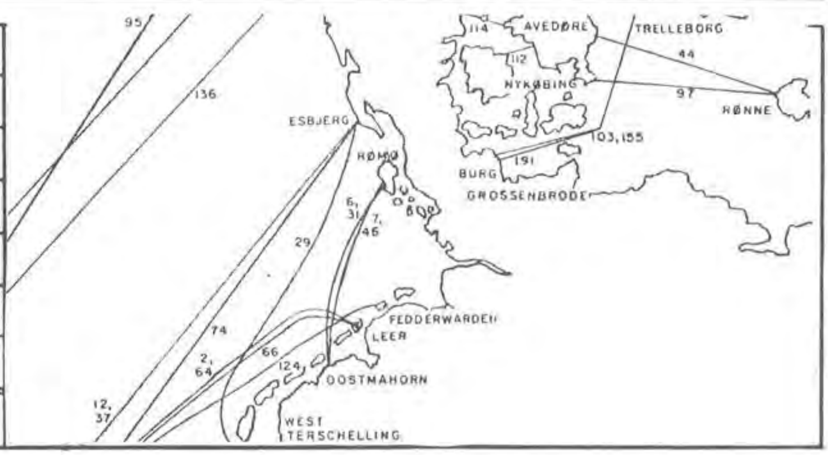
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 120 — now 120 — CHANNEL SPACING, INITIAL: 4 kHz — now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR: STC

POWER FEED MODE: single end — NOMINAL VOLTAGE: 1200 — SYSTEM CURRENT: 0.340 A

TASI TYPE: - — CIRCUITS USED: - — CIRCUITS DERIVED: - — TOTAL CIRCUITS: - — DATE APPLIED: -

COST	$ MILLION
CABLE	0.56
SUBMERGED ELECTRONICS	0.26
TERMINAL AND POWER FEED	0.20
TERMINAL STATIONS	0.20
INSTALLATION	0.08
TOTAL	1.30
SYSTEM DESIGN LIFE	20 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **32**

OFFICIAL NAME	Aldeburgh-Domburg No. 6	ACRONYM	ALD - DOM 6
OTHER NAMES	U.K. -Netherlands Aldeburgh-Domburg A		
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Aldeburgh, Suffolk	TERMINUS B	Domburg, Walcheren
LANDING POINT A	Aldeburgh	LANDING POINT B	Domburg
COORDINATES A	52°10'N x 1°36' E	COORDINATES B	51°34' N x 3°30' E

OWNER A	British Post Office	CIRCUITS HELD	180 h
OWNER B	Administration of PTT	CIRCUITS HELD	180 h
I R U HOLDERS	none		
CIRCUITS HELD	-		

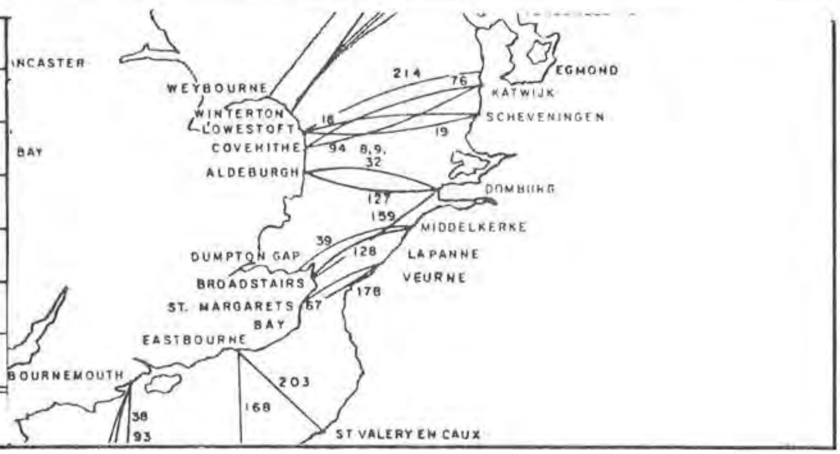
A repeater with amplification in the high band only was inserted in the 1947 non-repeatered cable

DATE IN SERVICE	1957	NATURE OF SERVICE	commercial	CABLE MILES	82	SINGLE OR TWIN	single	SYSTEM TYPE	K Mk I

CABLE DESCRIPTION	armored polyethylene/air coaxial	CABLE SIZE	1.7" 43.2 mm
CABLE MANUFACTURER	Telegraph Construction & Maintenance Company	CABLESHIP USED	ALERT (3)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	1
REPEATER SPACING	-		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	744+744 kHz	TRANSMISSION FREQUENCIES	60-804+1056-1800 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	180	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	single end	NOMINAL VOLTAGE	225
SYSTEM CURRENT	0.316 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.75
SUBMERGED ELECTRONICS	0.06
TERMINAL AND POWER FEED	0.21
TERMINAL STATIONS	0.22
INSTALLATION	0.06
TOTAL	1.30
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **33**

OFFICIAL NAME	Hawaii No. 1	ACRONYM	HAW-1
OTHER NAMES	Hawaii-California 1 (E-W)(W-E) Point Arena-Hanauma Bay		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A. (Hawaii)
TERMINUS A	Point Arena, California	TERMINUS B	Hanauma Bay, Oahu
LANDING POINT A	Point Arena	LANDING POINT B	Hanauma Bay
COORDINATES A	38^{o} 59' N x 123^{o}42' W	COORDINATES B	21^{o}16' N x 157^{o}42' W

OWNER A	American Telephone & Telegraph Company			CIRCUITS HELD	7+32 h
OWNER B	Hawaiian Telephone Company			CIRCUITS HELD	32 h
I R U HOLDERS	ATT/RCAGC	ITTWC	RCAGC	WUI	ATT/SEACOM
CIRCUITS HELD	1	3	3	2	3
LESSEES	none				
CIRCUITS LEASED	-				

DATE IN SERVICE 1957 | NATURE OF SERVICE commercial | CABLE MILES 2197 2210 | SINGLE OR TWIN twin | SYSTEM TYPE SB

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.62" 15.7 mm

CABLE MANUFACTURER Submarine Cables Ltd. and Simplex Wire & Cable Co.

REPEATER DESCRIPTION articulated flexible unidirectional | NUMBER OF REPEATERS 57+57 | REPEATER SPACING 38 nm

REPEATER MANUFACTURER Western Electric Company | CABLESHIPS USED MONARCH (4), OCEAN LAYER BASIL O LENOIR

NOMINAL TRANSMISSION BANDWIDTH 144+144 kHz | TRANSMISSION FREQUENCIES 20-164+20-164 kHz

NUMBER OF EQUALIZERS 2+1 | EQUALIZATION METHOD adjust cable length; select equalizers

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 36 now 51 | CHANNEL SPACING, INITIAL 4 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company | Construction contractor ATT

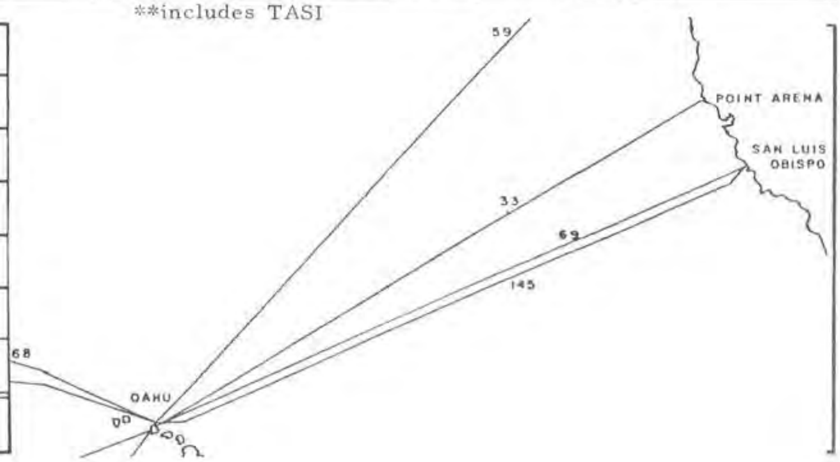
POWER FEED MODE double end | NOMINAL VOLTAGE 2170/2170 | SYSTEM CURRENT 0.225 A

TASI TYPE A | CIRCUITS USED 30* | CIRCUITS DERIVED 37 | TOTAL CIRCUITS 73 | DATE APPLIED 1961

*plus seven circuits from Hawaii 2

**includes TASI

COST	$ MILLION
CABLE	20.72
SUBMERGED ELECTRONICS	6.75
TERMINAL AND POWER FEED	1.46
TERMINAL STATIONS **	2.46
INSTALLATION	3.01
TOTAL	34.40
SYSTEM DESIGN LIFE	24 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **34**

OFFICIAL NAME	Marseille-Bordj el Kiffan		
OTHER NAMES	Marseille-Algiers	France - Algeria 1	
COUNTRY A	France	COUNTRY B	Algeria
TERMINUS A	Marseille	TERMINUS B	Bordj El Kiffan
LANDING POINT A	Marseille	LANDING POINT B	Bordj El Kiffan
COORDINATES A	43°16' N x 5°23' E	COORDINATES B	36°53' N x 3°2' E

OWNER A	Administration of Telecommunications	CIRCUITS HELD	80 h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	80 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1957	NATURE OF SERVICE	commercial	CABLE MILES	477	SINGLE OR TWIN	single	SYSTEM TYPE	F 60

CABLE DESCRIPTION armored polyethylene coaxial — CABLE SIZE 0.61" 15.6 mm

CABLE MANUFACTURER Les Câbles de Lyon — CABLESHIPS USED: AMPERE (3), ALSACE, EMILE BAUDOT

REPEATER DESCRIPTION articulated flexible bidirectional — NUMBER OF REPEATERS 28 — REPEATER SPACING 16.5 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications

NOMINAL TRANSMISSION BANDWIDTH 240+240 kHz — TRANSMISSION FREQUENCIES 24-264+312-552 kHz

NUMBER OF EQUALIZERS 2 — EQUALIZATION METHOD adjust cable length; select equalizers

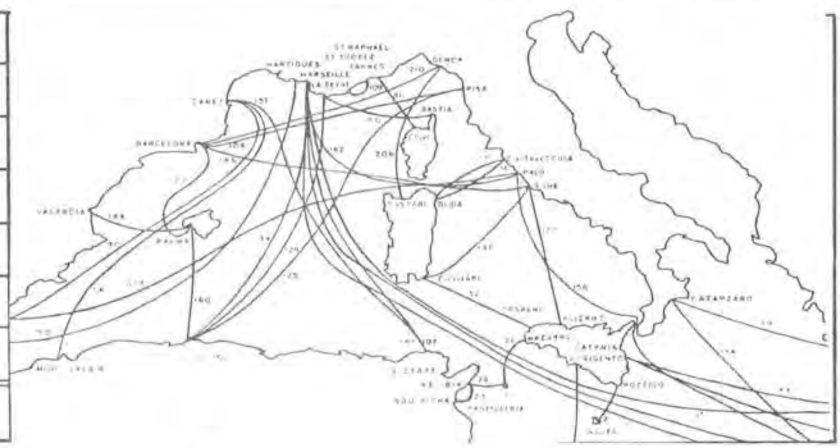
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 60 now 80 — CHANNEL SPACING, INITIAL 4 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT — CONSTRUCTION CONTRACTOR CIT

POWER FEED MODE double end — NOMINAL VOLTAGE 1500/1500 — SYSTEM CURRENT 0.211 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	2.27
SUBMERGED ELECTRONICS	1.97
TERMINAL AND POWER FEED	0.31
TERMINAL STATIONS	0.34
INSTALLATION	0.08
TOTAL	4.97
SYSTEM DESIGN LIFE	20 years



BECAME PART OF NO. 65 IN 1964

SEACABLE SYSTEM DATA PROFILE

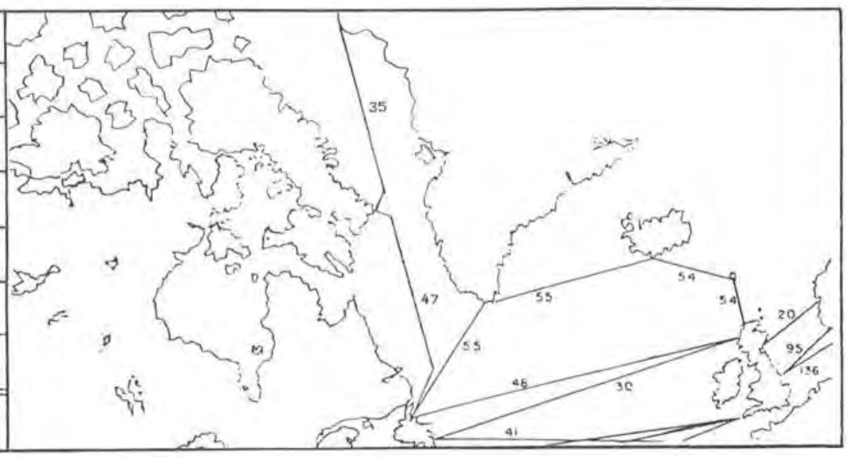
SYSTEM REFERENCE NUMBER **35**

OFFICIAL NAME	Cape Dyer-Thule		
OTHER NAMES			
COUNTRY A	Canada	COUNTRY B	Denmark(Greenland)
TERMINUS A	Cape Dyer	TERMINUS B	Thule U.S. AFB
LANDING POINT A	Cape Dyer	LANDING POINT B	Thule
COORDINATES A	$76^{o}35'N \times 61^{o}12'W$	COORDINATES B	$76^{o}32'N \times 68^{o}49'W$

OWNER A	Canadian Defense Establishment	CIRCUITS HELD 36h
OWNER B	U. S. Department of Defense	CIRCUITS HELD 36h
	In 1964 the Cape Dyer-Thule system and the White Bay-Cape Dyer system (No. 47) were removed from Cape Dyer and joined in the sea to form the White Bay-Thule system, No. 65.	

DATE IN SERVICE	1957	NATURE OF SERVICE	military	CABLE MILES	720 +720	SINGLE OR TWIN	twin	SYSTEM TYPE	SB		
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.62" 15.7 mm		
CABLE MANUFACTURER	Simplex Wire & Cable Company					CABLESHIP USED	ALBERT J MYER				
REPEATER DESCRIPTION	articulated flexible unidirectional					NUMBER OF REPEATERS	20 + 20	REPEATER SPACING	38 nm		
REPEATER MANUFACTURER	Western Electric Company										
NOMINAL TRANSMISSION BANDWIDTH	144 + 144 kHz	TRANSMISSION FREQUENCIES	20-164 + 20-164 kHz								
NUMBER OF EQUALIZERS	1 + 1	EQUALIZATION METHOD	adjust cable elngth and select equalizer								
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36					CHANNEL SPACING, INITIAL	4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company					CONSTRUCTION CONTRACTOR	ATT				
POWER FEED MODE	double end	NOMINAL VOLTAGE				SYSTEM CURRENT	0.225 A				
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED			

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	20 years



RETIRED 1982

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **36**

OFFICIAL NAME	Italy-Sardinia I		
OTHER NAMES	Civitavecchia-Golfo d'Aranci 1		
COUNTRY A	Italy (mainland)	COUNTRY B	Italy (Sardinia)
TERMINUS A	Civitavecchia	TERMINUS B	Olbia
LANDING POINT A	Civitavecchia	LANDING POINT B	Golfo d'Aranci
COORDINATES A	42°6' N x 11°48' E	COORDINATES B	41°0' N x 9°38' E

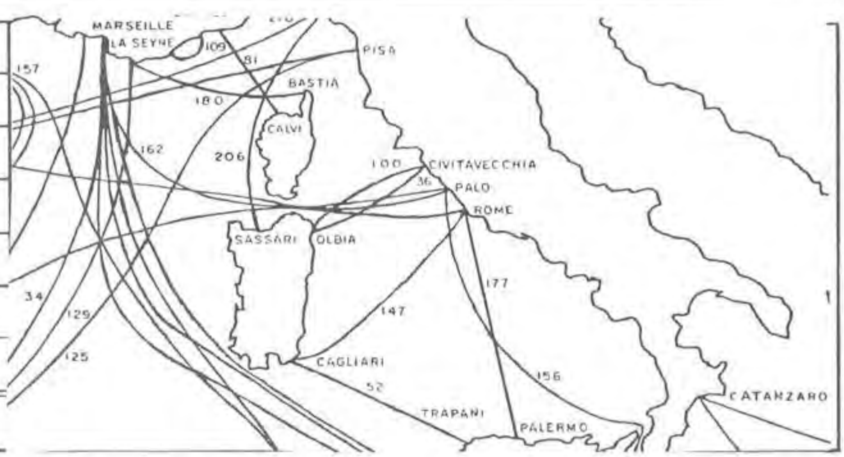
OWNER	Ministero delle Poste e delle Telecommunicazioni	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1957	NATURE OF SERVICE	commercial	CABLE MILES	130	SINGLE OR TWIN	single	SYSTEM TYPE	J Mk I

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Pirelli S.p.A., Arco Felice, Naples	CABLESHIP USED	SALERNUM
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	6
		REPEATER SPACING	18
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	20-260: 312-552 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 now 60	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited		
POWER FEED MODE	single end	NOMINAL VOLTAGE	1000
SYSTEM CURRENT	0.316 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.49
SUBMERGED ELECTRONICS	0.21
TERMINAL AND POWER FEED	0.28
TERMINAL STATIONS	0.31
INSTALLATION	0.21
TOTAL	1.50
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **37**

OFFICIAL NAME	Weybourne-Fanø		
OTHER NAMES			
COUNTRY A	England	COUNTRY B	Denmark
TERMINUS A	Weybourne, Norfolk	TERMINUS B	Esbjerg
LANDING POINT A	Weybourne	LANDING POINT B	Fanø
COORDINATES A	52°57' N x 1°9' E	COORDINATES B	55°25' N x 8°23' E

OWNER	The Great Northern Telegraph Co.	CIRCUITS HELD	all

This system was created by the installation of 5 new repeaters in place of the original two repeaters in system No. 12. It operates only for telegraph service, with 192 derived circuits.

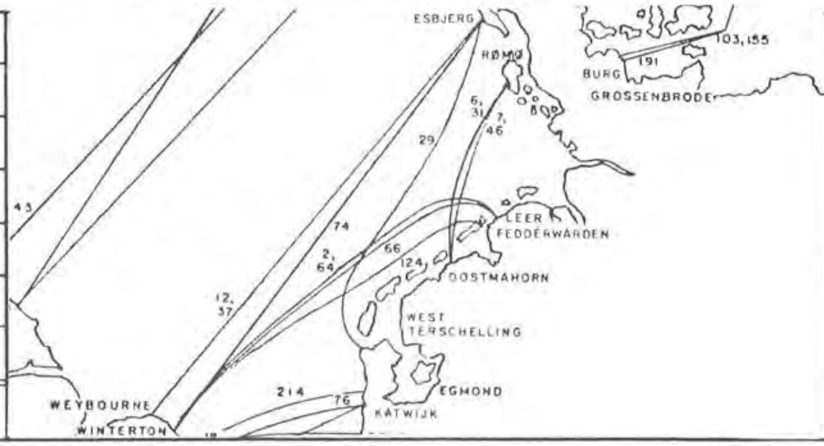
DATE IN SERVICE	1957	NATURE OF SERVICE	commercial	CABLE MILES	307	SINGLE OR TWIN	single	SYSTEM TYPE	Z 7 S

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIP USED:	EDOUARD SUENSON
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG		

REPEATER DESCRIPTION	multicontainer flexible bidirectional	NUMBER OF REPEATERS	5	REPEATER SPACING	50 nm
NOMINAL TRANSMISSION BANDWIDTH	32+32 kHz	TRANSMISSION FREQUENCIES	8-40+48-80 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	7	now 8	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz	
TERMINAL EQUIPMENT MANUFACTURER	F&G Fernmeldeanlagen GmbH	CONSTRUCTION CONTRACTOR	F&G		
POWER FEED MODE	single end	NOMINAL VOLTAGE	850	SYSTEM CURRENT	0.445 A

TASI TYPE - CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.04
SUBMERGED ELECTRONICS	0.19
TERMINAL AND POWER FEED	0.23
TERMINAL STATIONS	0.24
INSTALLATION	0.09
TOTAL	1.79
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **38**

OFFICIAL NAME	St. Helier-Tuckton Bridge A		
OTHER NAMES	St. Helier-Tuckton Bridge No. 1	Hengistbury Head-St. Helier No. 1	
COUNTRY A	Jersey	COUNTRY B	England
TERMINUS A	St. Helier	TERMINUS B	Tuckton Bridge
LANDING POINT A	St. Helier	LANDING POINT B	Hengistbury Head
COORDINATES A	$49^{\circ}08'$ N x $2^{\circ}5'$ W	COORDINATES B	$50^{\circ}42'$ N x $1^{\circ}48'$ W

OWNER	British Post Office	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1958	NATURE OF SERVICE	commercial	CABLE MILES	131	SINGLE OR TWIN	single	SYSTEM TYPE	L Mk I

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	ARIEL
REPEATER MANUFACTURER	STC and Submarine Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	10	REPEATER SPACING	12.5 nm

NOMINAL TRANSMISSION BANDWIDTH 492+492 kHz TRANSMISSION FREQUENCIES 60-552+672-1164 kHz

NUMBER OF EQUALIZERS none EQUALIZATION METHOD -

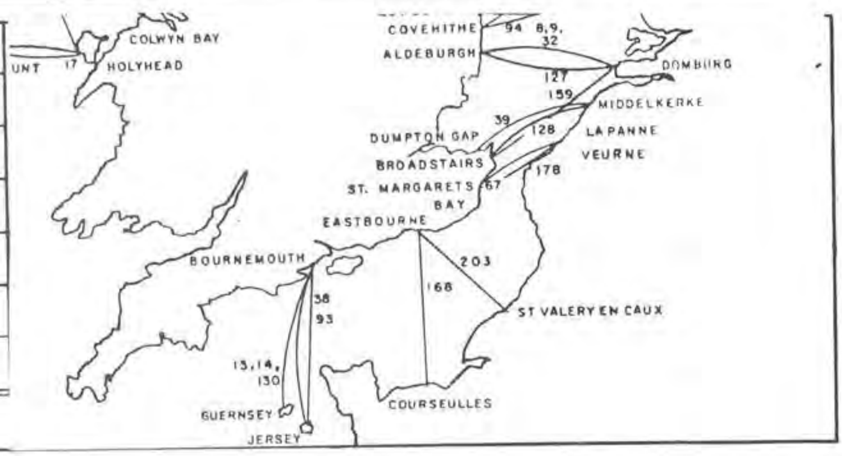
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 now 120 CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Limited

POWER FEED MODE double end NOMINAL VOLTAGE 700/700 SYSTEM CURRENT 0.336 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	0.37
SUBMERGED ELECTRONICS	0.26
TERMINAL AND POWER FEED	0.22
TERMINAL STATIONS	0.23
INSTALLATION	0.06
TOTAL	1.14
SYSTEM DESIGN LIFE	20 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **39**

OFFICIAL NAME	Dumpton Gap-Middelkerke		
OTHER NAMES	Canterbury- Oostende A	U.K. - Belgium 2	
COUNTRY A	England	COUNTRY B	Belgium
TERMINUS A	Canterbury, Kent	TERMINUS B	Oostende
LANDING POINT A	Dumpton Gap	LANDING POINT B	Middelkerke
COORDINATES	51°23' N x 1°24' E	COORDINATES B	51°11' N x 2°48' E

OWNER A	British Post Office	CIRCUITS HELD	120 h
OWNER B	Régie des Télégraphs et des Téléphones	CIRCUITS HELD	120 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1958	NATURE OF SERVICE	commercial	CABLE MILES	76	SINGLE OR TWIN	single	SYSTEM TYPE	M MK I

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	IRIS (2)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	3
		REPEATER SPACING	18.6 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 now 120	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	STC	CONSTRUCTION CONTRACTOR	BPO
POWER FEED MODE	double end	NOMINAL VOLTAGE	300/300
		SYSTEM CURRENT	0.316 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.35
SUBMERGED ELECTRONICS	0.17
TERMINAL AND POWER FEED	0.35
TERMINAL STATIONS	0.36
INSTALLATION	0.07
TOTAL	1.30
SYSTEM DESIGN LIFE	20 years

40 unassigned

RETIRED 1982

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **41**

OFFICIAL NAME	Transatlantic No. 2	ACRONYM	TAT 2
OTHER NAMES	Penmarc'h-Clarenville-Sydney Mines TAT 2(E-W)(W-E)		Clarenville-Sydney Mines 2
COUNTRY A	France	COUNTRY B	Canada
TERMINUS A	Penmarc'h	TERMINUS B	Clarenville, Newfoundland
LANDING POINT A	Penmarc'h	LANDING POINT B	Clarenville
COORDINATES A	$47^{\circ}50'$N x $4^{\circ}21'$W	COORDINATES B	$48^{\circ}09'$N x $53^{\circ}57'$W

As originally configured, there was a 60/80 circuit British system extending to Sydney Mines

OWNERS PTT France, Deutsche Bundespost, and American Tel & Tel Co.

ATT/PTT: 13 ATT/DBP: 15

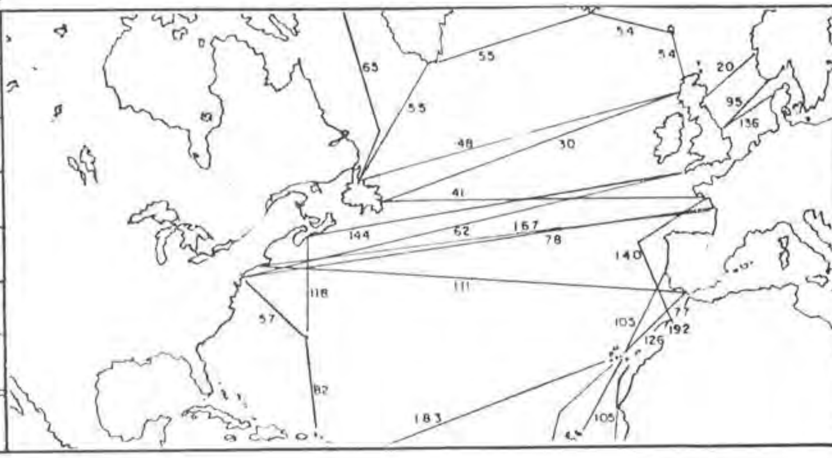
I R U HOLDERS ATT with Belgium, Israel, ITALCABLE, Netherlands, Switzerland

CIRCUITS HELD	1	4	3	2	2		
	PTT with FC	ITTWC	RCAGC	WUI;	DBP with RCAGC	WUI	ITTWC
	2	2	1	1	1	1	1

DATE IN SERVICE 1959	NATURE OF SERVICE commercial	CABLE MILES AB:2209 BA:2194	SINGLE OR TWIN twin; SYSTEM TYPE SB
CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7mm
CABLE MANUFACTURERS	Submarine Cables Ltd., Simplex, NSW, and Câbles de Lyon		
REPEATER DESCRIPTION	articulated flexible unidirectional	NUMBER OF REPEATERS AB:57 BA:57	REPEATER SPACING 38 nm
REPEATER MANUFACTURER	Western Electric Company	CABLESHIPS USED:	MONARCH (4), OCEAN LAYER AMPERE (3), IRIS (2)
NOMINAL TRANSMISSION BANDWIDTH	144 + 144 kHz	TRANSMISSION FREQUENCIES	20-164 + 20-164 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36 now 48	CHANNEL SPACING, INITIAL	4 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE double end	NOMINAL VOLTAGE 2140/2140	SYSTEM CURRENT	0.225 A
TASI TYPE A CIRCUITS USED 24*	CIRCUITS DERIVED 37	TOTAL CIRCUITS 74	DATE APPLIED 1960

* plus 13 circuits from TAT 4

COST	$ MILLION
CABLE	25.99
SUBMERGED ELECTRONICS	6.02
TERMINAL AND POWER FEED	2.58
TERMINAL STATIONS	6.21
INSTALLATION	1.90
TOTAL	42.70
SYSTEM DESIGN LIFE	24 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **42**

OFFICIAL NAME	Florida-Puerto Rico (N-S)(S-N)	ACRONYM	FLORICO
OTHER NAMES	West Palm Beach-San Juan	PR-1	
COUNTRY A	U.S.A.	COUNTRY B	U.S.A. (Puerto Rico)
TERMINUS A	West Palm Beach, Florida	TERMINUS B	San Juan
LANDING POINT A	Palm Beach	LANDING POINT B	Condado Beach
COORDINATES A	26°43' N x 80°02' W	COORDINATES B	18°28' N x 66°04' W

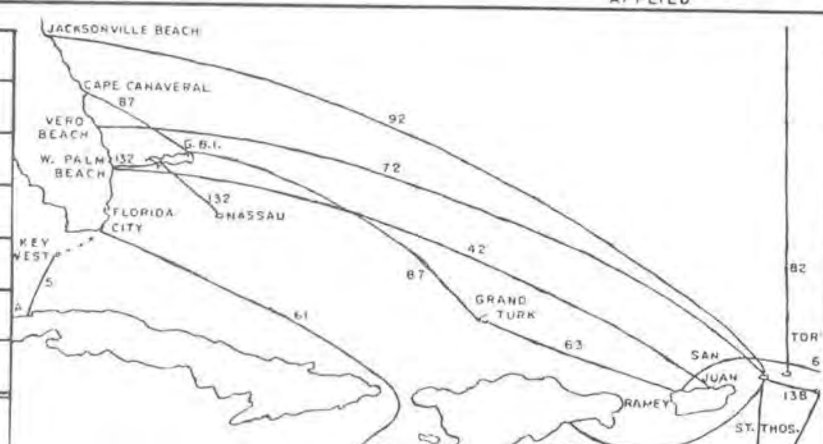
OWNER A	American Telephone & Telegraph Company		CIRCUITS HELD	44 h
OWNER B	All America Cables & Radio		CIRCUITS HELD	44 h
I R U HOLDERS	ITTWC with AACR	RCAGC with AACR	WUI with AACR	
CIRCUITS HELD	2	1	3	
LESSEES				
CIRCUITS LEASED				

DATE IN SERVICE	1960	NATURE OF SERVICE	commercial	CABLE MILES	1136 ~~1117~~	SINGLE OR TWIN	twin	SYSTEM TYPE	SB

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Simplex Wire & Cable Company, Standard Telephones & Cables Limited, and Norddeutsche Seekabelwerke AG		
REPEATER DESCRIPTION	articulated flexible unidirectional	NUMBER OF REPEATERS	30 29
REPEATER SPACING	40 nm		
REPEATER MANUFACTURER	Western Electric Company	CABLESHIP USED:	MONARCH (4)
NOMINAL TRANSMISSION BANDWIDTH	144+144 kHz	TRANSMISSION FREQUENCIES	20-164+20-164 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	adjust cable length
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	50 now 50	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Co.	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	1180/1180
SYSTEM CURRENT	0.225 A		
TASI TYPE A CIRCUITS USED	37	CIRCUITS DERIVED	37
TOTAL CIRCUITS	74	DATE APPLIED	1962

*includes TASI

COST	$ MILLION
CABLE	8.76
SUBMERGED ELECTRONICS	2.01
TERMINAL AND POWER FEED	1.55
TERMINAL STATIONS *	2.37
INSTALLATION	1.41
TOTAL	16.1
SYSTEM DESIGN LIFE	24 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

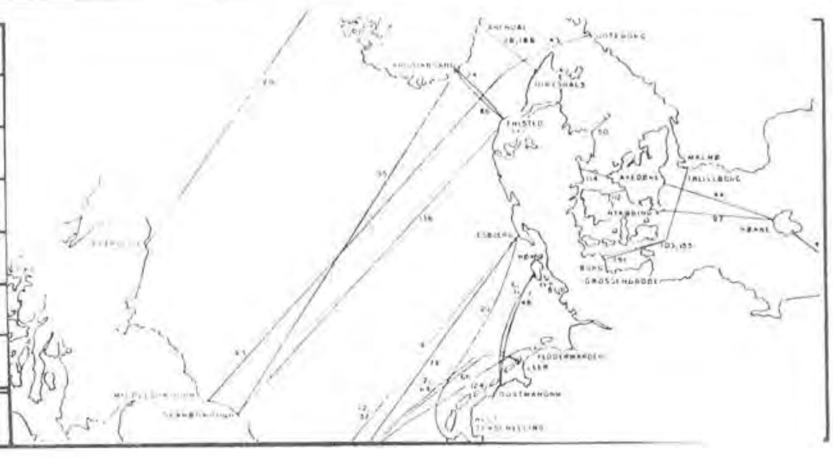
SYSTEM REFERENCE NUMBER **43**

OFFICIAL NAME	Göteborg-Middlesbrough		
OTHER NAMES	Sandvik-Marske		
COUNTRY A	Sweden	COUNTRY B	England
TERMINUS A	Göteborg	TERMINUS B	Middlesbrough
LANDING POINT A	Sandvik	LANDING POINT B	Marske
COORDINATES A	57°44' N x 11°44' E	COORDINATES B	54°36' N x 1°1' W

OWNER A	Administration of Telecommunications	CIRCUITS HELD	60 h
OWNER B	British Post Office	CIRCUITS HELD	60 h
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1960
NATURE OF SERVICE	commercial
CABLE MILES	528
SINGLE OR TWIN	single
SYSTEM TYPE	N Mk I
CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited
CABLESHIPS USED:	MONARCH (4) ARIEL
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	29
REPEATER SPACING	18.0 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz
TRANSMISSION FREQUENCIES	60-300+360-608 kHz
NUMBER OF EQUALIZERS	1
EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 now 60
CHANNEL SPACING, INITIAL	4 kHz now 4kHz
TERMINAL EQUIPMENT MANUFACTURER	STC
CONSTRUCTION CONTRACTOR	BPO
POWER FEED MODE	single end
NOMINAL VOLTAGE	3500
SYSTEM CURRENT	0.415 A
TASI TYPE	–
CIRCUITS USED	–
CIRCUITS DERIVED	–
TOTAL CIRCUITS	–
DATE APPLIED	–

COST	$ MILLION
CABLE	1.8
SUBMERGED ELECTRONICS	1.1
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.2
INSTALLATION	0.2
TOTAL	3.7
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **44**

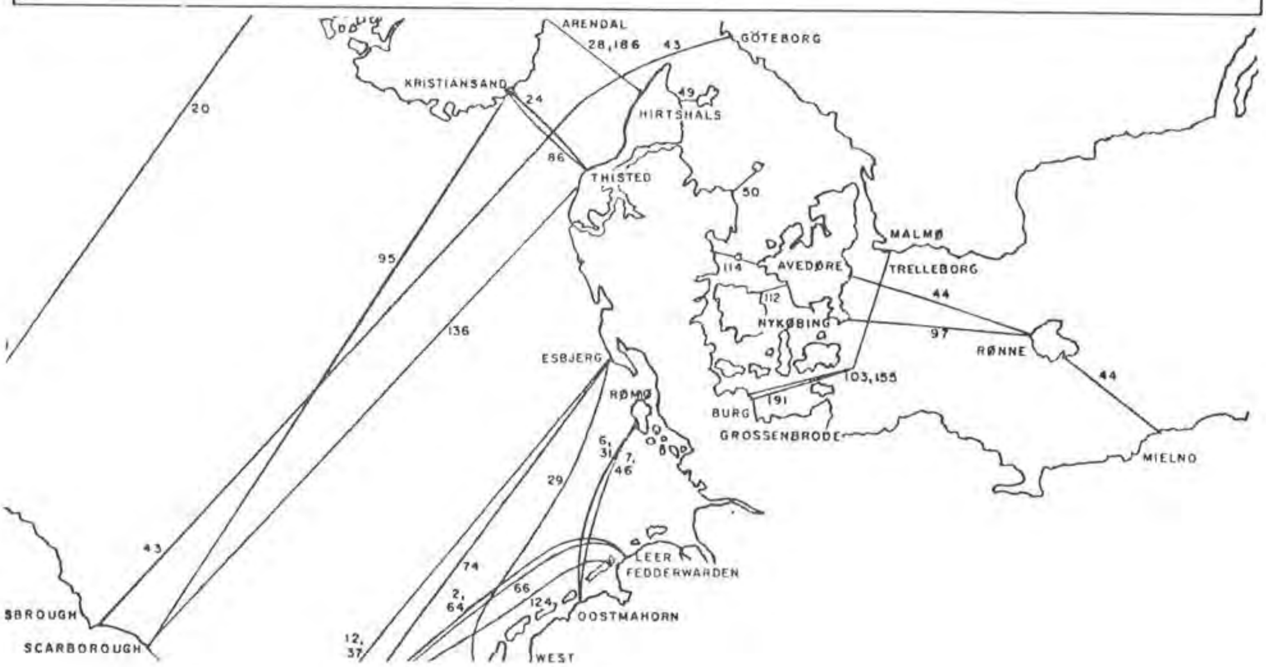
OFFICIAL NAME	Denmark-Poland
OTHER NAMES	Copenhagen-Bornholm-Mielno

COUNTRY A	Denmark	COUNTRY B	Denmark
TERMINUS A	Copenhagen	TERMINUS B	Rønne, Isle of Bornholm
LANDING POINT A	Avedøre	LANDING POINT B	Blykobbe
COORDINATES A	55°37' N x 12°31' E	COORDINATES B	55°08' N x 14°42' E

COUNTRY C	Denmark	COUNTRY D	Poland
TERMINUS C	Rønne	TERMINUS D	Bielice
LANDING POINT C	Mølle Bugt	LANDING POINT D	Mielno
COORDINATES C	55°05' N x 14°44' E	COORDINATES D	54°16' N x 16°03' E

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 105	BC -	CD 71				
DATE IN SERVICE	1960	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	AB: Z120S CD: Z60S
CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.62" 15.7 mm		
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG						



44
continued

OWNERS	AB: Administration of P.&T., Denmark CD: above, plus Administration of P.&T., Poland and Great Northern Telegraph Co.
CIRCUITS HELD	
I.R.U. HOLDERS	
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

REPEATER DESCRIPTION	multicontainer flexible bidirectional — REPEATER SPACING AB: 10 nm CD: 17 nm
NUMBER OF REPEATERS	AB 10 — CD 3
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG
NUMBER OF EQUALIZERS	AB none — CD none
EQUALIZATION METHOD	-
TERMINAL EQUIPMENT MANUFACTURER	F&G Fernmeldeanlagen GmbH
POWER FEED MODE	AB single end — CD single end
NOMINAL VOLTAGE	1000 — 430 — SYSTEM CURRENT 0.426 A
NOMINAL TRANSMISSION BANDWIDTH	AB: 492+492 kHz BD: 240+240 kHz — TRANSMISSION FREQUENCIES 60-552+672-1164 kHz 24-264+312-552 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AB:120 now 120 CD: 60 now 60 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	CABLESHIPS USED: NORDENHAM, EDOUARD SUENSON, C E KRARUP

CONSTRUCTION CONTRACTOR	Felten & Guilleaume Carlswerk AG

COST	$ MILLION
CABLE	0.7
SUBMERGED ELECTRONICS	0.6
TERMINAL AND POWER FEED	0.2
TERMINAL STATIONS	0.2
INSTALLATION	0.3
TOTAL	2.0
SYSTEM DESIGN LIFE	20 years

45 unassigned

RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **46**

OFFICIAL NAME	Oostmahorn-Rømø No. 2		
OTHER NAMES	Leeuwarden-Rømø No. 2		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Oostmahorn, Friesland	TERMINUS B	Rømø
LANDING POINT A	Oostmahorn	LANDING POINT B	Rømø
COORDINATES A	53°24' N x 6°10'E	COORDINATES B	55°05' N x 8°29' E

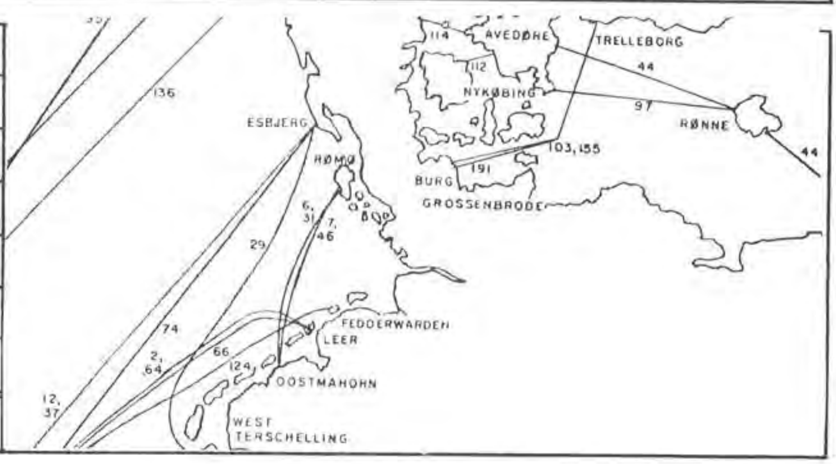
OWNER A	Administration of PTT	CIRCUITS HELD	120h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	120h

This system was created by installing seven 120-channel repeaters in place of the original two 36-channel repeaters in System No. 7

DATE IN SERVICE	1961	NATURE OF SERVICE	commercial	CABLE MILES	142	SINGLE OR TWIN	single	SYSTEM TYPE	M Mk I

- CABLE DESCRIPTION: armored polyethylene coaxial — CABLE SIZE 0.935" 23.7 mm
- CABLE MANUFACTURER: Submarine Cables Limited — CABLESHIPS USED: MONARCH (4), POOLSTER (2), C F KRARUP, PETER FABER (2)
- REPEATER DESCRIPTION: monocontainer inflexible bidirectional — NUMBER OF REPEATERS: 7 — REPEATER SPACING: 20 nm
- REPEATER MANUFACTURER: Standard Telephones & Cables, Ltd. — CONSTRUCTION CONTRACTOR: STC
- NOMINAL TRANSMISSION BANDWIDTH: 492+492 kHz — TRANSMISSION FREQUENCIES: 60-552+672-1164 kHz
- NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: –
- NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 120 now 120 — CHANNEL SPACING, INITIAL: 4 kHz now 4 kHz
- TERMINAL EQUIPMENT MANUFACTURER: Standard Telephones & Cables Ltd.
- POWER FEED MODE: single end — NOMINAL VOLTAGE: 1200 — SYSTEM CURRENT: 0.340 A
- TASI TYPE: – CIRCUITS USED: – CIRCUITS DERIVED: – TOTAL CIRCUITS: – DATE APPLIED: –

COST	$ MILLION
CABLE	0.56
SUBMERGED ELECTRONICS	0.33
TERMINAL AND POWER FEED	0.29
TERMINAL STATIONS	0.02
INSTALLATION	0.11
TOTAL	1.31
SYSTEM DESIGN LIFE	20 years



BECAME PART OF NO.65 IN 1964

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **47**

OFFICIAL NAME	Cape Dyer-White Bay		
OTHER NAMES			
COUNTRY A	Canada	COUNTRY B	Canada
TERMINUS A	Cape Dyer	TERMINUS B	White Bay
LANDING POINT A	Cape Dyer	LANDING POINT B	Hampden
COORDINATES A	76°35'N x 61°12'W	COORDINATES B	49°32'N x 56°52'W

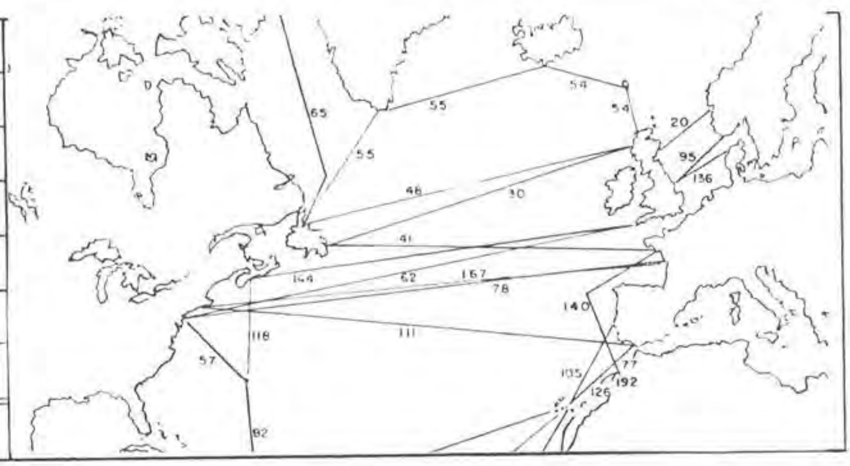
Owned jointly by the Canadian Defense Establishment and the

United States Department of Defense

In 1964 the Cape Dyer-White Bay system and the Cape Dyer-Thule system (No. 35) were removed from Cape Dyer and joined in the sea to become the White Bay-Thule system, No. 65.

DATE IN SERVICE	1957	NATURE OF SERVICE	military	CABLE MILES	1078 +1078	SINGLE OR TWIN	twin	SYSTEM TYPE	SB
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.62' 15.7mm		
CABLE MANUFACTURER	Simplex Wire & Cable Company					CABLESHIPS USED:	MONARCH (4) ALBERT J MYER		
REPEATER DESCRIPTION	articulated flexible unidirectional					NUMBER OF REPEATERS	30 + 30	REPEATER SPACING	38 nm
REPEATER MANUFACTURER	Western Electric Company								
NOMINAL TRANSMISSION BANDWIDTH	144 + 144 kHz	TRANSMISSION FREQUENCIES	20-164 + 20-164 kHz						
NUMBER OF EQUALIZERS	2 + 2	EQUALIZATION METHOD	adjust cable length and select equalizer						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	36					CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company					CONSTRUCTION CONTRACTOR	ATT		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1100/1100			SYSTEM CURRENT	0.225 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **48**

OFFICIAL NAME	Canada Transatlantic 1	ACRONYM	CANTAT 1
OTHER NAMES	Corner Brook - Oban		
COUNTRY A	Canada	COUNTRY B	United Kingdom
TERMINUS A	Corner Brook, Newfoundland	TERMINUS B	Oban, Scotland
LANDING POINT A	White Bay	LANDING POINT B	Oban
COORDINATES A	$49^{o}32'N \times 56^{o}52'W$	COORDINATES B	$56^{o}28'N \times 5^{o}30'W$

OWNERS: British Post Office, Teleglobe Canada, and Cable and Wireless Limited

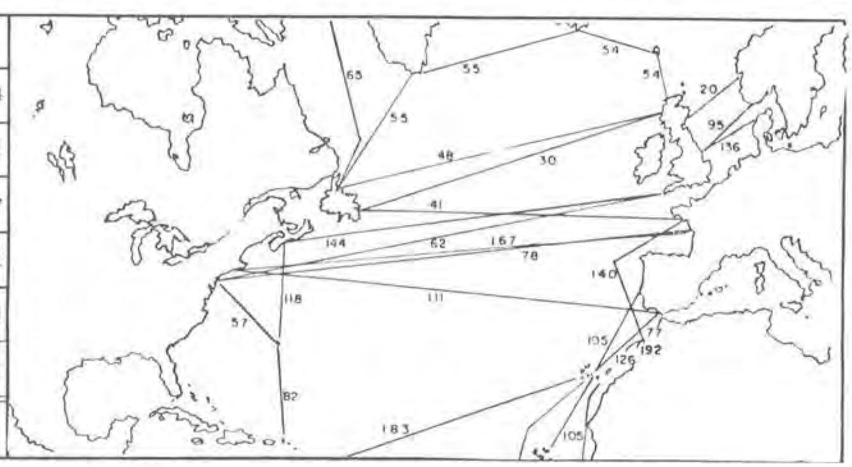
The CANTAT project, Oban - Corner Brook, was joined to a companion project called CANTAT B, extending from Corner Brook to Grosse Roches. Contracted separartely by the then-named Canadian Overseas Telecommunicatons Corporation with Submarine Cables Limited, it consisted of 400 miles of armored 0.935" polyethylene coaxial with 20 repeaters and 2 equalizers, to operate 2 super-groups at 4 kHz spacing (120 circuits). CANTAT B went into service at the same time as CANTAT. At a later date the 12-channel banks were replaced by 16s, providing 160 circuits. CANTAT B was retired in 1976.

DATE IN SERVICE	1961	NATURE OF SERVICE	commercial	CABLE MILES	2073	SINGLE OR TWIN	single	SYSTEM TYPE	N Mk II

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Submarine Cables Ltd. and Standard Telephones and Cables Ltd.		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	90
REPEATER SPACING	26 nm		
REPEATER MANUFACTURERS	SCL and STC	CABLESHIPS USED:	MONARCH (4), ARIEL ALBERT J MYER
NOMINAL TRANSMISSION BANDWIDTH	240 + 240 kHz	TRANSMISSION FREQUENCIES	60-300 + 360-608 kHz
NUMBER OF EQUALIZERS	8	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 now 80	CHANNEL SPACING, INITIAL	4 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	STC	CONSTRUCTION CONTRACTOR	BPO
POWER FEED MODE	double end	NOMINAL VOLTAGE	5000/5000
SYSTEM CURRENT	0.415 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	11.34
SUBMERGED ELECTRONICS	5.51
TERMINAL AND POWER FEED	0.57
TERMINAL STATIONS	0.72
INSTALLATION	1.29
TOTAL	19.43
SYSTEM DESIGN LIFE	20 years



RETIRED 1975

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **49**

OFFICIAL NAME	Frederikshavn-Laeso		
OTHER NAMES			
COUNTRY A	Denmark	COUNTRY B	Denmark
TERMINUS A	Frederikshavn	TERMINUS B	Byrum, Laeso Is.
LANDING POINT A	Saeby	LANDING POINT B	Vesterø Havn
COORDINATES A	$57^{\circ}21'$ N x $10^{\circ}33'$ E	COORDINATES B	$57^{\circ}17'$N x $10^{\circ}56'$ E

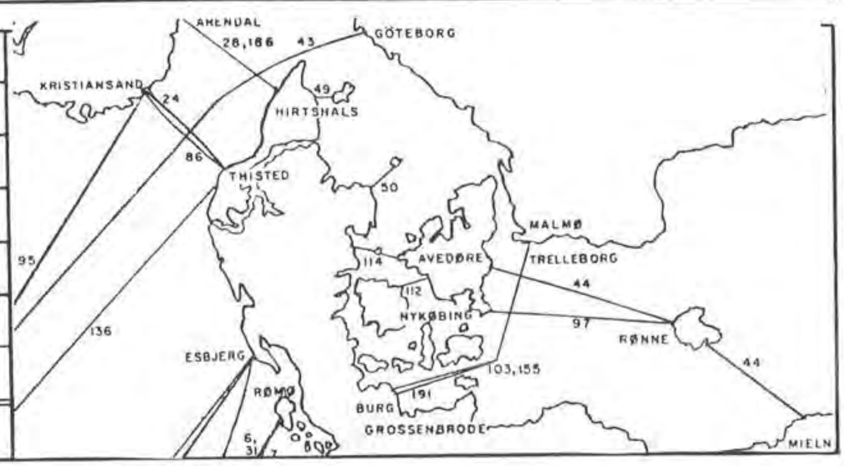
OWNER	Jutland Telephone Company	CIRCUITS HELD	all

Systems Nos. 49 and 50 were fitted with the first submerged repeaters using solid-state devices (transistors) in lieu of thermionic vacuum tubes.

DATE IN SERVICE	1961	NATURE OF SERVICE	commercial	CABLE MILES	14	SINGLE OR TWIN	quad	SYSTEM TYPE	

CABLE DESCRIPTION	armored guttapercha insulated copper quad	CABLE SIZE	Conductors $4.45\ mm^2$
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG	CABLESHIP USED:	PETER FABER (2)
REPEATER DESCRIPTION	monocontainer inflexible twin amplifier transistorized	NUMBER OF REPEATERS	2
REPEATER SPACING	12.6 nm		
REPEATER MANUFACTURER	Telecommunications Research Labor.	CONSTRUCTION CONTRACTOR	TRL
NOMINAL TRANSMISSION BANDWIDTH	102+102 kHz	TRANSMISSION FREQUENCIES	6-108+6-108 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	24 final 24	CHANNEL SPACING, INITIAL	4 kHz final 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Siemens & Halske and Felten & Guilleaume Fernmeldeanlagen		
POWER FEED MODE	double end	NOMINAL VOLTAGE	67/54
SYSTEM CURRENT	0.028 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



RETIRED 1975

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **50**

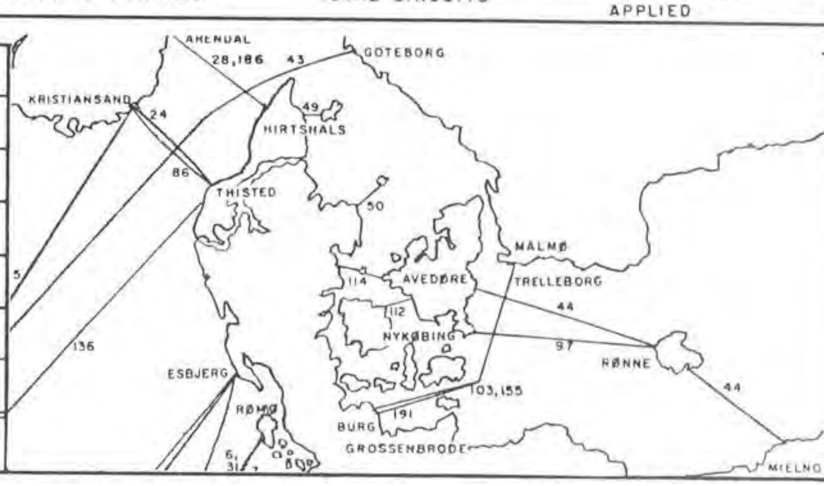
OFFICIAL NAME	Grenå-Anholt		
OTHER NAMES			
COUNTRY A	Denmark	COUNTRY B	Denmark
TERMINUS A	Grenå	TERMINUS B	Anholt
LANDING POINT A	Fornaes	LANDING POINT B	Anholt
COORDINATES A	56°21'N x 10°58' E	COORDINATES B	56°41' N x 11°32' E

OWNER	Jutland Telephone Company	CIRCUITS HELD	all

Systems Nos. 49 and 50 were fitted with the first known submerged repeaters uding solid-state devices in lieu of thermionic vacuum tubes.

DATE IN SERVICE	1961	NATURE OF SERVICE	commercial	CABLE MILES	25	SINGLE OR TWIN	single cable 4 pairs	SYSTEM TYPE	
CABLE DESCRIPTION	armored guttapercha insulated 4 copper pairs					CABLE SIZE	Conductors 3.01 mm^2		
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG			CABLESHIP USED:	PETER FABER (2)				
REPEATER DESCRIPTION	monocontainer inflexible twin amplifier transistored			NUMBER OF REPEATERS	1	REPEATER SPACING	-		
REPEATER MANUFACTURER	Telecommunications Research Laboratories, Denmark								
NOMINAL TRANSMISSION BANDWIDTH	48+48 kHz	TRANSMISSION FREQUENCIES	6-54+6-54 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	12	final	12	CHANNEL SPACING, INITIAL	4 kHz	final	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Philips-Eindhoven	CONSTRUCTION CONTRACTOR	TRL						
POWER FEED MODE	single end	NOMINAL VOLTAGE	67	SYSTEM CURRENT	0.028 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	10 years



SEACABLE SYSTEM DATA PROFILE

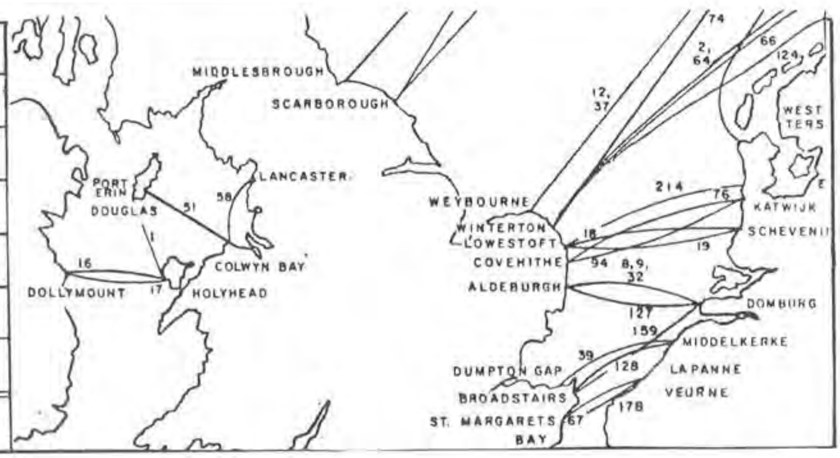
SYSTEM REFERENCE NUMBER **51**

OFFICIAL NAME	Colwyn Bay - Douglas		
OTHER NAMES	Colwyn Bay - Port Greenaugh		
COUNTRY A	United Kingdom (Wales)	COUNTRY B	United Kingdom (Isle of Man)
TERMINUS A	Colwyn Bay, Denbighshire	TERMINUS B	Douglas
LANDING POINT A	Colwyn Bay	LANDING POINT B	Port Greenaugh
COORDINATES A	53°18' N x 3°44' W	COORDINATES B	54°6' N x 4°34' W

OWNER	British Post Office	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	CABLE MILES	61	SINGLE OR TWIN	single	SYSTEM TYPE	L Mk II
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Submarine Cables Ltd. and Standard Telephones & Cables Ltd.								
REPEATER DESCRIPTION	monocontainer inflexible bidirectional					NUMBER OF REPEATERS	4	REPEATER SPACING	12.6 nm
REPEATER MANUFACTURER	SCL and STC			CABLESHIP USED:	ARIEL				
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz			TRANSMISSION FREQUENCIES	60-552+672-1164 kHz				
NUMBER OF EQUALIZERS	none			EQUALIZATION METHOD	-				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120	now 120				CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz	
TERMINAL EQUIPMENT MANUFACTURER	STC					CONSTRUCTION CONTRACTOR	BPO		
POWER FEED MODE	double end	NOMINAL VOLTAGE	375/375			SYSTEM CURRENT	0.316 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.45
SUBMERGED ELECTRONICS	0.40
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	0.25
INSTALLATION	0.08
TOTAL	1.43
SYSTEM DESIGN LIFE	20 years



RETIRED 1982

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **52**

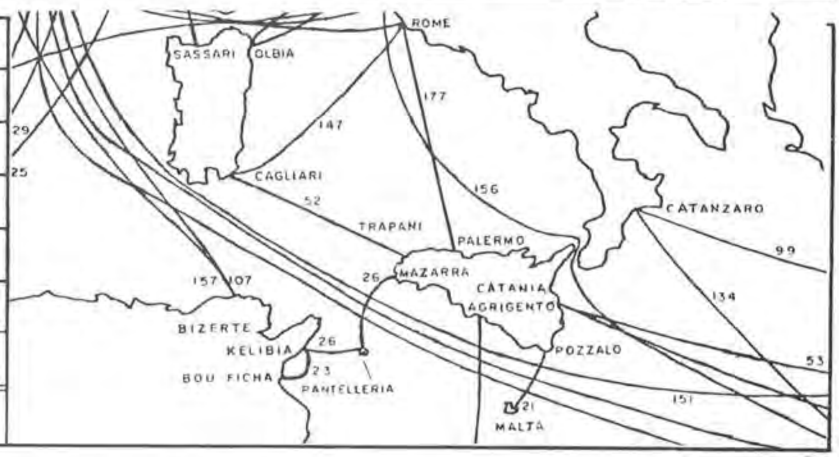
OFFICIAL NAME	Trapani-Cagliari		
OTHER NAMES			
COUNTRY A	Italy (Sicily)	COUNTRY B	Italy (Sardinia)
TERMINUS A	Trapani	TERMINUS B	Cagliari
LANDING POINT A	Trapani	LANDING POINT B	Cagliari
COORDINATES A	38°1' N x 12°32' E	COORDINATES B	39°13' N x 9°6' E

OWNER	Ministero delle Poste e delle Telecommunicazione	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	CABLE MILES	218	SINGLE OR TWIN	single	SYSTEM TYPE	L Mk II

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Pirelli S.p.A. Arco Felice, Naples	CABLESHIP USED:	SALERNUM
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS 17	REPEATER SPACING 12 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 now 120	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE 1500/1500	SYSTEM CURRENT 0.316 A
TASI TYPE - CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST	$ MILLION
CABLE	0.84
SUBMERGED ELECTRONICS	0.61
TERMINAL AND POWER FEED	0.34
TERMINAL STATIONS	0.32
INSTALLATION	0.19
TOTAL	2.30
SYSTEM DESIGN LIFE	20 years



RETIRED 1976

SEACABLE SYSTEM DATA PROFILE

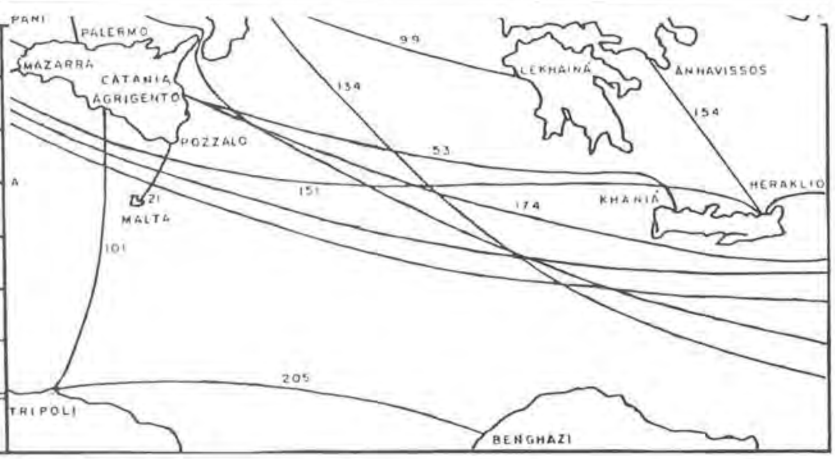
SYSTEM REFERENCE NUMBER **53**

OFFICIAL NAME	Sicily-Crete		
OTHER NAMES	MED 2		
COUNTRY A	Italy (Sicily)	COUNTRY B	Greece (Crete)
TERMINUS A	Catania	TERMINUS B	Khaniá
LANDING POINT A	Catania	LANDING POINT B	Khaniá
COORDINATES A	37°29' N x 15° 4' E	COORDINATES B	35°43' N x 24°0'E

OWNER A	Administration of Posts and Telegraphs	CIRCUITS HELD	60h
OWNER B	Hellenic Telecommunications Organization (OTE)	CIRCUITS HELD	60h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1962
NATURE OF SERVICE	commercial
CABLE MILES	501
SINGLE OR TWIN	single
SYSTEM TYPE	N Mk II
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Pirelli and Les Càbles de Lyon
CABLESHIP USED:	SALERNUM
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	23
REPEATER SPACING	18 nm
REPEATER MANUFACTURER	Submarine Cables Ltd. and Standard Telephones & Cables Ltd.
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz
TRANSMISSION FREQUENCIES	20-260+312-552 kHz
NUMBER OF EQUALIZERS	1
EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 final 60
CHANNEL SPACING, INITIAL	4 kHz final 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	STC
CONSTRUCTION CONTRACTOR	SCL
POWER FEED MODE	single end
NOMINAL VOLTAGE	3000
SYSTEM CURRENT	0.415 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	1.49
SUBMERGED ELECTRONICS	0.63
TERMINAL AND POWER FEED	0.23
TERMINAL STATIONS	0.23
INSTALLATION	0.18
TOTAL	2.81
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **54**

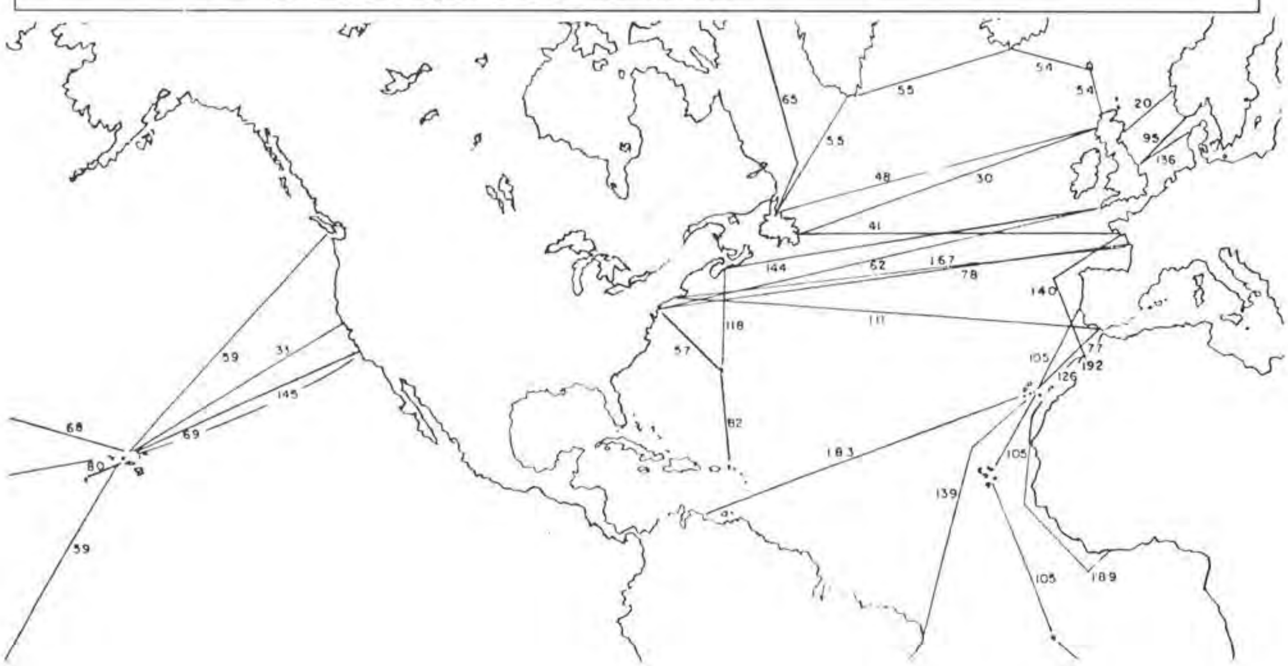
OFFICIAL NAME	Scotland-Faeroes-Iceland	ACRONYM	SCOTICE
OTHER NAMES	Gairloch-Velbestad-Vestmannaeyjar		

COUNTRY A	United Kingdom	COUNTRY B	Denmark (Faeroe Is.)
TERMINUS A	Gairloch, Scotland	TERMINUS B	Torshavn, Strømø (A)
LANDING POINT A	Gairloch	LANDING POINT B	Velbestad
COORDINATES A	$57^{o}43'$ N x $5^{o}42'$ W	COORDINATES B	$61^{o}59'$ N x $6^{o}51'$ W

COUNTRY C	Iceland	COUNTRY D	
TERMINUS C	Vestmannaeyjar, Heimaey Is.	TERMINUS D	
LANDING POINT C	Klauf	LANDING POINT D	
COORDINATES C	$63^{o}24'$ N x $20^{o}17'$ W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 284	B C 401					
DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	61-LTE-117
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.46" 11.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



54
continued

OWNERS	AB: British Post Office, Adm. of P. and T., Denmark, and Great Northern Telegraph Co. BC: Administration of P. and T., Denmark and Great Northern Telegraph Company
CIRCUITS HELD	AB: jointly 29 BC: jointly 29
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	ICAO and Government Agencies
CIRCUITS LEASED	AB: 7 BC: 6

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING 27 nm
NUMBER OF REPEATERS	A B 10 B C 15
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	A B none B C 1
EQUALIZATION METHOD	adjust length and select equalizer
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	A B double end B C double end
NOMINAL VOLTAGE	850/850 1240/1240 — SYSTEM CURRENT 0.316 A
NOMINAL TRANSMISSION BANDWIDTH	AB: 84+84 kHz BC: 78+78 kHz — TRANSMISSION FREQUENCIES AB: 120-204 BA:12-96 kHz BC: 120-198 CB:18-96 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	24 now 29 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	A stations: AB Torshavn BC Torshavn — CABLESHIPS USED: ALERT (4) JOHN W MACKAY

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited

COST	$ MILLION
CABLE	1.6
SUBMERGED ELECTRONICS	1.0
TERMINAL AND POWER FEED	0.3
TERMINAL STATIONS	0.3
INSTALLATION	0.4
TOTAL	3.6
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **55**

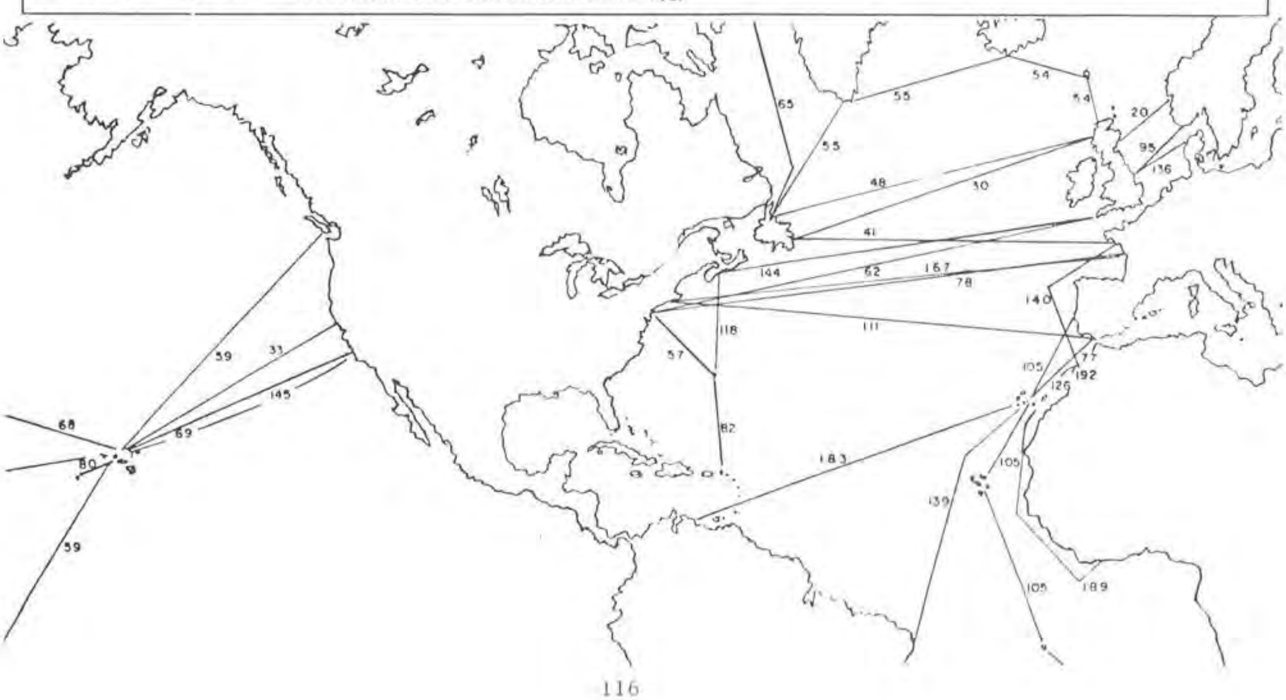
OFFICIAL NAME	Iceland-Greenland-Canada	ACRONYM	ICECAN
OTHER NAMES	Vestmannaeyjar - Frederiksdal-Hampden- Corner Brook		

COUNTRY A	Iceland	COUNTRY B	Greenland
TERMINUS A	Vestmannaeyjar, Heimaey Is.	TERMINUS B	Frederiksdal
LANDING POINT A	Klauf	LANDING POINT B	Frederiksdal
COORDINATES A	63°24' N x 20°17' W	COORDINATES B	59°59' N x 44°36' W

COUNTRY C	Canada
TERMINUS C	Corner Brook
LANDING POINT C	Hampden
COORDINATES C	49°32' N x 56°52' W

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 829	B C 948					
DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	Z-18-S
CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.46" 11.7 mm		
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG						



OWNERS	AB: Great Northern Telegraph Company BC: Great Northern Telegraph Company and Canadian Overseas Telecommunications Corporation, now Teleglobe Canada
CIRCUITS HELD	28
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	ICAO and Government Agencies
CIRCUITS LEASED	AB: 3 BC: 4

REPEATER DESCRIPTION	monocontainer flexible bidirectional; REPEATER SPACING 22 nm
NUMBER OF REPEATERS	A B 38 B C 41
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG
NUMBER OF EQUALIZERS	A B 4 B C 4
EQUALIZATION METHOD	designed and assembled on board
TERMINAL EQUIPMENT MANUFACTURER	F&G Fernmeldeanlagen GmbH and Siemens & Halske AG
POWER FEED MODE	A B double end B C double end
NOMINAL VOLTAGE	2300/2300 2600/2600; SYSTEM CURRENT 0.426 A
NOMINAL TRANSMISSION BANDWIDTH	77+77 kHz; TRANSMISSION FREQUENCIES 10-87+103-180 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	20 now 28; CHANNEL SPACING, INITIAL 3 & 4 kHz now 3 kHz
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	A stations: AB : Frederiksdal BC: Corner Brook*

CONSTRUCTION CONTRACTOR	Felten & Guilleaume Carlswerk AG	CABLESHIPS USED:	NEPTUN(3) EDOUARD SUENSON

COST	$ MILLION
CABLE	5.47
SUBMERGED ELECTRONICS	3.76
TERMINAL AND POWER FEED	0.91
TERMINAL STATIONS	1.03
INSTALLATION	0.46
TOTAL	11.63
SYSTEM DESIGN LIFE	20 years

*As originally configured, there were two Z 18 S repeaters on land, one in the cable-landing hut at Hampden and one at Splice 39 in the cable between Hampden and Deer Lake. From Deer Lake a Z 60 S system with two unattended intermediate land repeaters, accommodating 60 channels, extended onward to Corner Brook.

Recently the Z 18 S terminal equipment at Deer Lake has been relocated to Corner Brook, and the sea system, now with 24 3kHz-spaced circuits, is extended to Corner Brook, requiring the placement of a Z 18 S repeater between Deer Lake and Corner Brook. The Z 60 S system has been retired.

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **56**

OFFICIAL NAME	Canet Plage-Mers el Kebir		
OTHER NAMES	Perpignan-Oran	France-Algeria 2	
COUNTRY A	France	COUNTRY B	Algeria
TERMINUS A	Perpignan, Pyrénées Orientales	TERMINUS B	Oran
LANDING POINT A	Canet Plage	LANDING POINT B	Mers el Kebir
COORDINATES A	42°42 N x 3°03' E	COORDINATES B	35°39' N x 0°47' W

OWNER A	Administration of Posts and Telecommunications, France	CIRCUITS HELD	
OWNER B	Administration of Posts and Telecommunications, Algeria	CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1962 — NATURE OF SERVICE commercial — CABLE MILES 542 — SINGLE OR TWIN single — SYSTEM TYPE F 60

CABLE DESCRIPTION armored polyethylene coaxial — CABLE SIZE 0.61" 15,6 mm

CABLE MANUFACTURER Les Câbles de Lyon — CABLESHIP USED: MARCEL BAYARD

REPEATER DESCRIPTION multicontainer flexible bidirectional — NUMBER OF REPEATERS 31 — REPEATER SPACING 17.3 nm

REPEATER MANUFACTURER Cie. Industrielle de Télécommunications

NOMINAL TRANSMISSION BANDWIDTH 240+240 kHz — TRANSMISSION FREQUENCIES 24-264+312-552 kHz

NUMBER OF EQUALIZERS 5 — EQUALIZATION METHOD preset; adjust block length; choice of 3 for No. 3

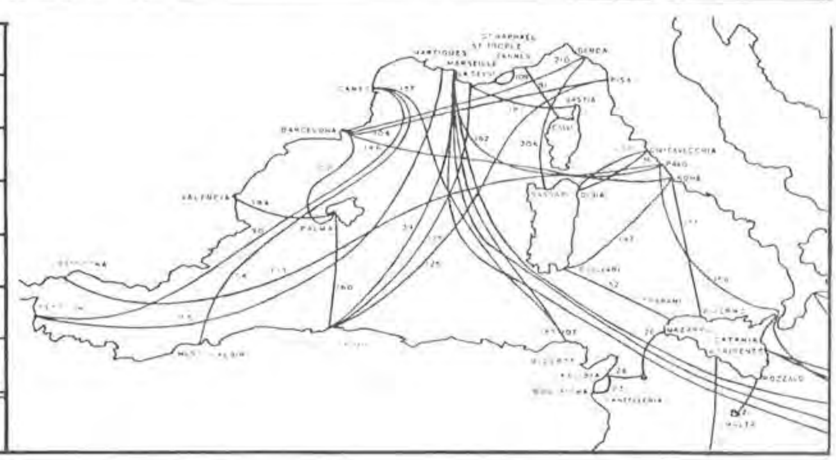
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 60 now 80 — CHANNEL SPACING, INITIAL 4 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT — CONSTRUCTION CONTRACTOR CIT

POWER FEED MODE double end — NOMINAL VOLTAGE 2400/2400 — SYSTEM CURRENT 0.211 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	2.60
SUBMERGED ELECTRONICS	2.43
TERMINAL AND POWER FEED	0.37
TERMINAL STATIONS	0.36
INSTALLATION	0.19
TOTAL	5.95
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

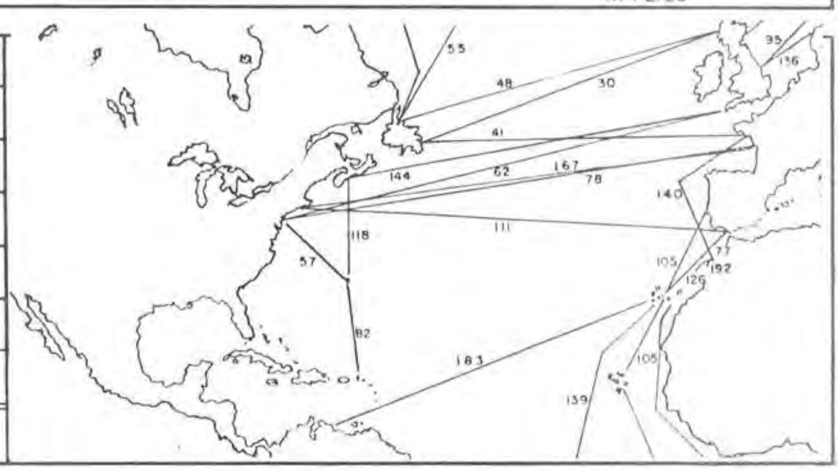
SYSTEM REFERENCE NUMBER **57**

OFFICIAL NAME	New Jersey-Bermuda	ACRONYM	BER-1
OTHER NAMES	US/BDA Manahawkin - Flatts		
COUNTRY A	Bermuda, B. C. C.	COUNTRY B	U.S.A.
TERMINUS A	Flatts	TERMINUS B	Manahawkin, N. J.
LANDING POINT A	Devonshire Bay	LANDING POINT B	Harvey Cedars
COORDINATES A	32°18' N x 64°44' W	COORDINATES B	39°41' N x 74°09' W

OWNER A	Cable & Wireless Limited			CIRCUITS HELD	73 h
OWNER B	American Telephone & Telegraph Company			CIRCUITS HELD	73 h
I R U HOLDERS	WUI/C&W	RCAGC/C&W	ITTWC/C&W		
CIRCUITS HELD	2	4	3		
LESSEES	ITTWC				
CIRCUITS LEASED	1				

DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	CABLE MILES	750	SINGLE OR TWIN	single	SYSTEM TYPE	N Mk V
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.1 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIPS MONARCH (4), USED: ALERT(4), RETRIEVER (5)			
REPEATER DESCRIPTION	monocontainer inflexible bidirectional					NUMBER OF REPEATERS	30	REPEATER SPACING	26 nm
REPEATER MANUFACTURER	Submarine Cables Ltd. and Standard Telephones & Cables Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	60-300+360-608 kHz						
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	80	now 82				CHANNEL SPACING, INITIAL	3 kHz	now 3 kHz	
TERMINAL EQUIPMENT MANUFACTURER	STC					CONSTRUCTION CONTRACTOR	STC & C&W		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1650/1650			SYSTEM CURRENT	0.415 A		
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -		TOTAL CIRCUITS -		DATE APPLIED	-		

COST	$ MILLION
CABLE	3.67
SUBMERGED ELECTRONICS	0.99
TERMINAL AND POWER FEED	0.88
TERMINAL STATIONS	0.36
INSTALLATION	0.70
TOTAL	6.6
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

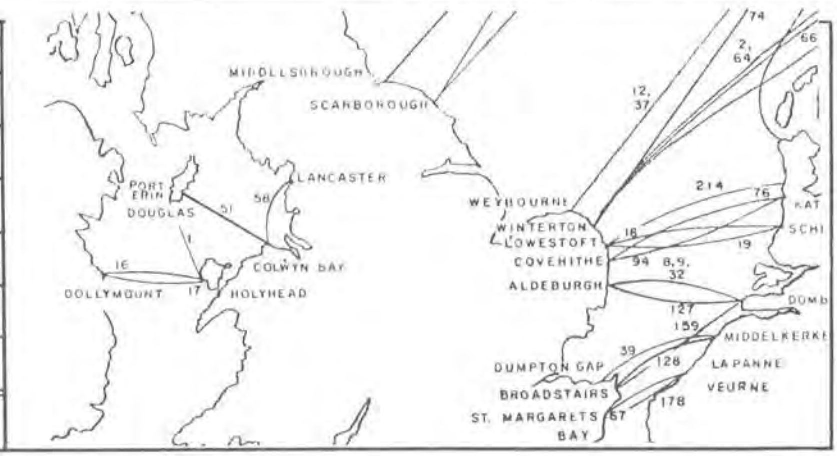
SYSTEM REFERENCE NUMBER **58**

OFFICIAL NAME	Colwyn Bay-Lancaster		
OTHER NAMES	Colwyn Bay-Heysham		
COUNTRY A	United Kingdom (Wales)	COUNTRY B	England
TERMINUS A	Colwyn Bay, Denbighshire	TERMINUS B	Lancaster, Lancashire
LANDING POINT A	Colwyn Bay	LANDING POINT B	Heysham
COORDINATES A	$53^{o}18'N \times 3^{o}44'$ W	COORDINATES B	$54^{o}2'N \times 2^{o}55'$ W

OWNER	British Post Office	CIRCUITS HELD	all
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1962	NATURE OF SERVICE	commercial	CABLE MILES	73	SINGLE OR TWIN	single	SYSTEM TYPE	L Mk II
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIP USED:	ALERT (4)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional					NUMBER OF REPEATERS	3	REPEATER SPACING	18.5 nm
REPEATER MANUFACTURER	Submarine Cables Limited and Standard Telephones & Cables Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz			TRANSMISSION FREQUENCIES	60-552+672-1164 kHz				
NUMBER OF EQUALIZERS	none			EQUALIZATION METHOD	-				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120	now	120			CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables					CONSTRUCTION CONTRACTOR	BPO		
POWER FEED MODE	single end			NOMINAL VOLTAGE	600	SYSTEM CURRENT	0.316 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.50
SUBMERGED ELECTRONICS	0.38
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	0.25
INSTALLATION	0.08
TOTAL	1.46
SYSTEM DESIGN LIFE	20 years



SEE NOTE

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **59**

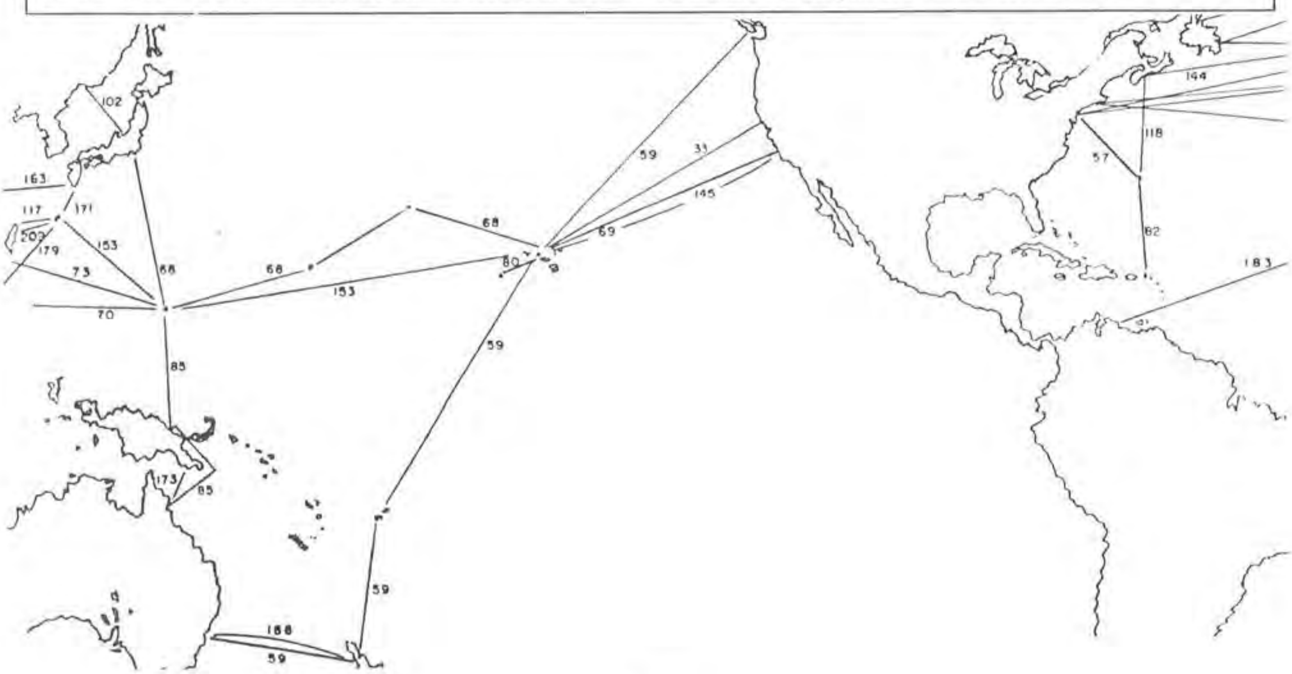
OFFICIAL NAME	Commonwealth Pacific Cable	ACRONYM	COMPAC
OTHER NAMES			

COUNTRY A	Canada	COUNTRY B	Canada
TERMINUS A	Vancouver, British Columbia	TERMINUS B	Port Alberni, Vancouver Is.(A)
LANDING POINT A	Vancouver	LANDING POINT B	Port Alberni
COORDINATES A	49°15' N x 123° 8' W	COORDINATES B	49°15' N x 124°45' W

COUNTRY C	U.S.A. (Hawaii)	COUNTRY D	Fiji
TERMINUS C	Keawaula Bay, Oahu (A)	TERMINUS D	Suva
LANDING POINT C	Keawaula Bay	LANDING POINT D	Suva
COORDINATES C	21°30' N x 158°14' W	COORDINATES D	18°8' S x 178°26' E

COUNTRY E	New Zealand	COUNTRY F	Australia
TERMINUS E	Auckland, North Island (A)	TERMINUS F	Sydney, New South Wales
LANDING POINT E	EAST: Takapuna WEST: Muriwai Beach	LANDING POINT F	Bondi Beach
COORDINATES E	36°49' S x 174°45' E 36°48' S x 174°25' E	COORDINATES F	33°44' S x 151°16' E

CABLE MILES	AB 81	BC 2546	CD 3073	DE 1260	EF 1273		
DATE IN SERVICE	AD: 1963 DF: 1962	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	N Mk V & Mk VIII
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.15 mm
CABLE MANUFACTURER	Submarine Cables Limited and Standard Telephones & Cables Limited						



SEE NOTE

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continued

OWNERS	AC: COTC*; CD: COTC, C&W, NZPO, OTC(A); DF: C&W, NZPO, OTC(A)		
CIRCUITS HELD			
I R U HOLDERS	ATT	ATT	HTC
CIRCUITS HELD	AC:14	CF:14	AC:3
LESSEES	none		
CIRCUITS LEASED	-		

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING 26 nm
NUMBER OF REPEATERS	AB 5 BC 100 CD 117 DE 50 EF 50
REPEATER MANUFACTURER	Submarine Cables Limited and Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	AB none BC 10 CD 12 DE 6 EF 6
EQUALIZATION METHOD	assembled on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	AB single end BC double end CD double end DE double end EF double end
NOMINAL VOLTAGE	500 5600/5600 5950/5950 2550/2550 2700/2700 — SYSTEM CURRENT 0.415 A
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz — TRANSMISSION FREQUENCIES 60-300+360-608 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	80 now 82 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TASI TYPE	B — CIRCUITS USED 33 — CIRCUITS DERIVED 94 — TOTAL CIRCUITS 127** — DATE APPLIED 1975
REMARKS	System "A" stations: AB; BC; CD; DE; EF

CONSTRUCTION CONTRACTOR	Cable & Wireless Limited	CABLESHIPS USED:	MONARCH (4), MERCURY RETRIEVER (5)

**This is pro-rata. Vancouver-Sydney TASI B uses 33 COMPAC bearers plus 38 SEACOM-TPC-HAW 3 bearers to provide 274 inlets. Of these, 33/71x274=127 may be ascribed to COMPAC. This cable thus carries 82-33 =49 hard-wire circuits, 33 TASI-and-through circuits, and 94 TASI-only circuits for a grand total of 176 circuits.

COST	$ MILLION
CABLE	40
SUBMERGED ELECTRONICS	20
TERMINAL AND POWER FEED	4
TERMINAL STATIONS	4
INSTALLATION	5
TOTAL	73
SYSTEM DESIGN LIFE	20 years

SPECIAL NOTE:

Sections AB, BC, and EF were retired when the Canada - Hawaii and Norfolk Island - New Zealand portions of ANZCAN, (project No. 261) were completed in 1983.

* COTC: Canadian Overseas Telecommunications Corporation (now Teleglobe Canada)
C&W: Cable & Wireless Limited
NZPO: New Zealand Post Office
OTC(A): Overseas Telecommunications Commission (Australia)
HTC: Hawaiian Telephone Company

60 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **61**

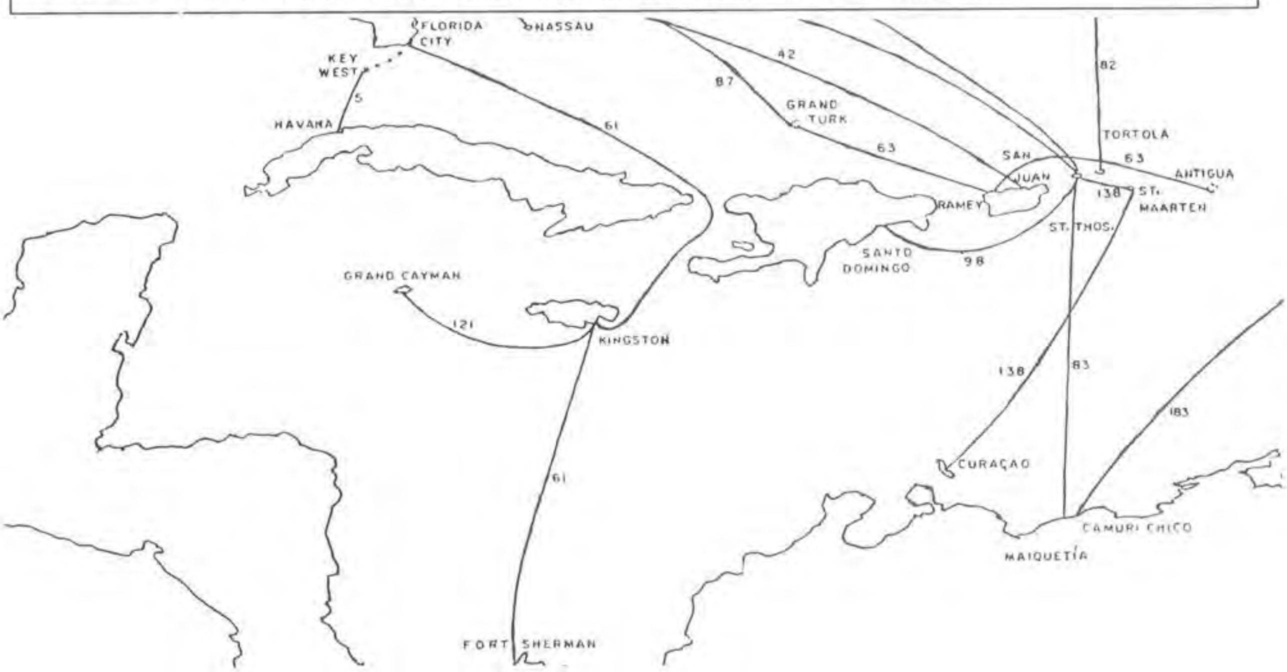
OFFICIAL NAME	Florida-Jamaica; Canal Zone-Jamaica
OTHER NAMES	Florida City-Kingston-Fort Sherman

COUNTRY A	U.S.A.	COUNTRY B	Jamaica
TERMINUS A	Florida City, Florida (A)	TERMINUS B	Kingston (B) (A)
LANDING POINT A	Florida City	LANDING POINT B	Seven Mile Point
COORDINATES A	$25^{o}19'N \times 80^{o}23' W$	COORDINATES B	$17^{o}57' N \times 76^{o}42' W$

COUNTRY C	U.S.A. (Canal Zone)	COUNTRY D	
TERMINUS C	Fort Sherman (B)	TERMINUS D	
LANDING POINT C	Devil's Beach	LANDING POINT D	
COORDINATES C	$9^{o}22' N \times 79^{o} 58' W$	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 834	BC 621					
DATE IN SERVICE	1963	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	SD
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Western Electric Co. and Standard Telephones & Cables Ltd.						



OWNERS	AB: A.T.&T. Co. and Jamaica International Telecommunications Limited BC: A.T.&T. Co. and I.T.T. Central America Cables & Radio, Inc.
CIRCUITS HELD	*
I R U HOLDERS	*
CIRCUITS HELD	
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	monocontainer flexible bidirectional							REPEATER SPACING	20 nm
NUMBER OF REPEATERS	AB 43	BC 32							
REPEATER MANUFACTURER	Western Electric Company								
NUMBER OF EQUALIZERS	AB 4	BC 3							
EQUALIZATION METHOD	networks selected by externally-controlled stepping switch								
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company								
POWER FEED MODE	AB single end	BC single end							
NOMINAL VOLTAGE	4150	4150						SYSTEM CURRENT	0.370 A
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz					TRANSMISSION FREQUENCIES	108-504+660-1052 kHz		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	128	now AB: 144 BC: 128		CHANNEL SPACING, INITIAL	3 kHz	now 3 kHz			
TASI TYPE	E	CIRCUITS USED	100	CIRCUITS DERIVED	130	TOTAL CIRCUITS	230	DATE APPLIED	1983
REMARKS					CABLESHIP USED: ALERT (4)				

CONSTRUCTION CONTRACTOR	American Telephone & Telegraph Company

COST	$ MILLION
CABLE	9.51
SUBMERGED ELECTRONICS	4.85
TERMINAL AND POWER FEED	3.54
TERMINAL STATIONS	1.30
INSTALLATION	1.40
TOTAL	20.6
SYSTEM DESIGN LIFE	24 years

* See following page

A-B UNITED STATES - JAMAICA CABLE

Allocation		Circuits
American Telephone & Telegraph Co.	ITT Central America Cables & Radio*	45
Western Union International, Inc.*	ITT Central America Cables & Radio*	4
RCA Global Communications, Inc.*	TRT Telecommunications Corporation*	4
ITT World Communications, Inc.*	ITT Central America Cables & Radio*	14
American Telephone & Telegraph Co.		2
TRT Telecommunications Corporation*		1
TRT Telecommunications Corporation*	Jamaica International Telecommunications, Limited	1
American Telephone & Telegraph Co.	Jamaica International Telecommunications, Limited	55
Canadian Overseas Telecommunications Corporation* (now Teleglobe Canada)	Jamaica International Telecommunications, Limited	11
Western Union International, Inc.*	Jamaica International Telecommunications, Limited	1
RCA Global Communications, Inc.*	Jamaica International Telecommunications, Limited	1
ITT World Communications, Inc.*	Jamaica International Telecommunications, Limited	1
Bahamas Telecommunications Corporation*	Jamaica International Telecommunications, Limited	2
Jamaica International Telecommunications, Limited		2
	TOTAL	144

B-C JAMAICA - CANAL ZONE CABLE

Allocation		Circuits
American Telephone & Telegraph Co.	ITT Central America Cables and Radio	62
American Telephone & Telegraph Co.		28
Western Union International, Inc.*	ITT Central America Cables and Radio	8
RCA Global Communications, Inc.*	TRT Telecommunications Corporation*	4
ITT World Communications, Inc.*	ITT Central America Cables and Radio	19
TRT Telecommunications Corporation*		3
TRT Telecommunications Corporation*	Jamaica International Telecommunications, Limited	2
RCA Global Communications, Inc.*	ITT Central America Cables and Radio	2
	TOTAL	128

* IRU

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **62**

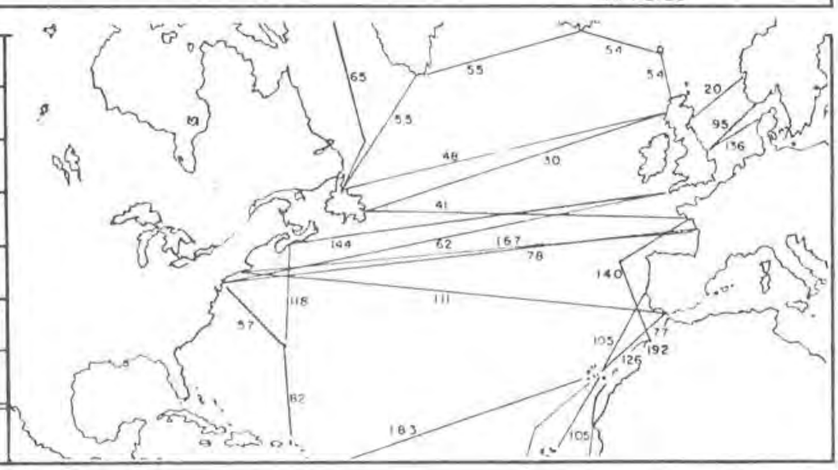
OFFICIAL NAME	Transatlantic No. 3	ACRONYM	TAT-3
OTHER NAMES	Tuckerton-Widemouth		
COUNTRY A	U.S.A.	COUNTRY B	United Kingdom
TERMINUS A	Tuckerton, New Jersey	TERMINUS B	Widemouth Bay, Cornwall
LANDING POINT A	Beach Haven	LANDING POINT B	Widemouth Bay
COORDINATES A	39°34' N x 74°14' W	COORDINATES B	50°47' N x 04°34'W

OWNER A	American Telephone & Telegraph Company				CIRCUITS HELD	106 h
OWNER B	British Post Office				CIRCUITS HELD	106 h
I R U HOLDERS	BPO with RCAGC	ITTWC	PW	WUI	FTCC	
CIRCUITS HELD	11	14	2	8	2	
LEASES	ATT to RCAGC	BPO to DBP				
CIRCUITS LEASED	3h	1h				

DATE IN SERVICE	1963	NATURE OF SERVICE	commercial	CABLE MILES	3518	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Standard Telephones & Cables, Ltd. and Western Electric Company		
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	182
REPEATER SPACING	20 nm		
REPEATER MANUFACTURER	Western Electric Company	CABLESHIPS USED:	LONG LINES, ALERT (4)
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz	TRANSMISSION FREQUENCIES	108-504+660-1052 kHz
NUMBER OF EQUALIZERS	17	EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	138 now 138	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	5000/5000
SYSTEM CURRENT	0.370 A		
TASI TYPE A CIRCUITS USED	37	CIRCUITS DERIVED	37
TOTAL CIRCUITS	74	DATE APPLIED	1965

COST	$ MILLION
CABLE	29.1
SUBMERGED ELECTRONICS	12.4
TERMINAL AND POWER FEED	3.1
TERMINAL STATIONS	4.0
INSTALLATION	2.0
TOTAL	50.6
SYSTEM DESIGN LIFE	24 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **63**

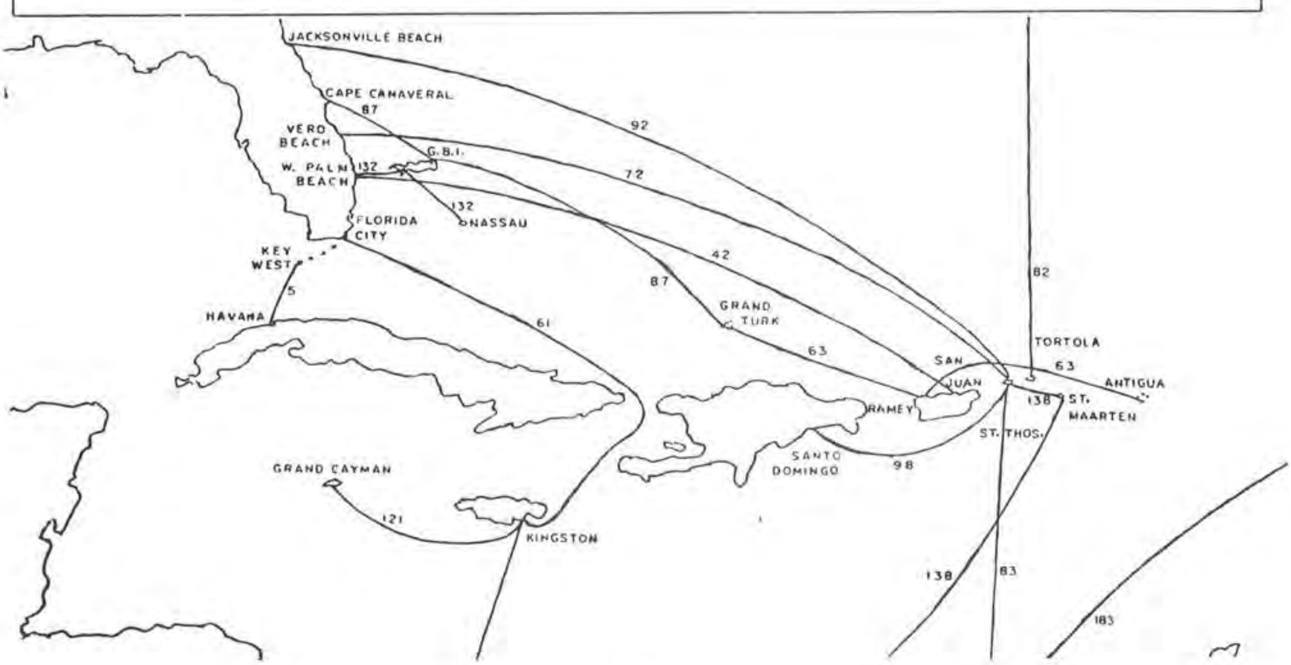
OFFICIAL NAME	Grand Turk - Antigua
OTHER NAMES	Turk-Ramey-Antigua Eastern Test Range No. 1

COUNTRY A	Turks/Caicos Islands	COUNTRY B	U.S.A. (Puerto Rico)
TERMINUS A	U.S.A.F. Facility, Grand Turk	TERMINUS B	Ramey
LANDING POINT A	Grand Turk	LANDING POINT B	Ramey
COORDINATES A	21°26' N x 71°9' W	COORDINATES B	18°29'N x 67°09''W

COUNTRY C	Antigua	COUNTRY D	
TERMINUS C	Coolidge A.F. Facility	TERMINUS D	
LANDING POINT C	Coolidge A.F.F.	LANDING POINT D	
COORDINATES C	17°10'N x 61°47' W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES AB 336	BC 377	CD	DE	EF	
DATE IN SERVICE 1963	NATURE OF SERVICE	military	SINGLE OR TWIN	single	SYSTEM TYPE Z60S
CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG				



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continued

OWNER	United States Government
CIRCUITS HELD	all
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	monocontainer flexible bidirectional — REPEATER SPACING 17 nm
NUMBER OF REPEATERS	A B 19 — B C 21
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG
NUMBER OF EQUALIZERS	A B 1 — B C 1
EQUALIZATION METHOD	compute and assemble on board
TERMINAL EQUIPMENT MANUFACTURER	F&G Fernmeldeanlagen GmbH
POWER FEED MODE	A B double end — B C double end
NOMINAL VOLTAGE	1000/1000 — 1000/1000 — SYSTEM CURRENT 0.426 A
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz — TRANSMISSION FREQUENCIES 24-264+312-552 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 — now 60 — CHANNEL SPACING, INITIAL 4 kHz — now 4 kHz
TASI TYPE -	CIRCUITS USED - — CIRCUITS DERIVED - — TOTAL CIRCUITS - — DATE APPLIED -
REMARKS	CABLESHIPS USED: NEPTUN(3), OMEGA

CONSTRUCTION CONTRACTOR	United States Underseas Cable Corporation

COST	$ MILLION
CABLE	2.6
SUBMERGED ELECTRONICS	1.6
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	-
INSTALLATION	1.2
TOTAL	6.3
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **64**

OFFICIAL NAME	Winterton-Borkum 1		
OTHER NAMES			
COUNTRY A	England	COUNTRY B	Federal Republic of Germany
TERMINUS A	Winterton, Norfolk	TERMINUS B	Leer, Ostfriesland
LANDING POINT A	Winterton	LANDING POINT B	Borkum-(Manslagt)
COORDINATES A	52°43' N x 1° 41' E	COORDINATES B	53°37'N x 6°43' E

OWNER A	British PostOffice	CIRCUITS HELD	120h
OWNER B	Deutsche Bundespost	CIRCUITS HELD	120h
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1963	NATURE OF SERVICE	commercial	CABLE MILES	251	SINGLE OR TWIN	single	SYSTEM TYPE	Q

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.	CABLESHIPS USED:	MONARCH (4), PETER FABER(2)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	20	REPEATER SPACING	11.7 nm

REPEATER MANUFACTURER Standard Telephones & Cables Ltd.

NOMINAL TRANSMISSION BANDWIDTH 492+492 kHz TRANSMISSION FREQUENCIES 60-552+672-1164 kHz

NUMBER OF EQUALIZERS 1 EQUALIZATION METHOD adjusted on board

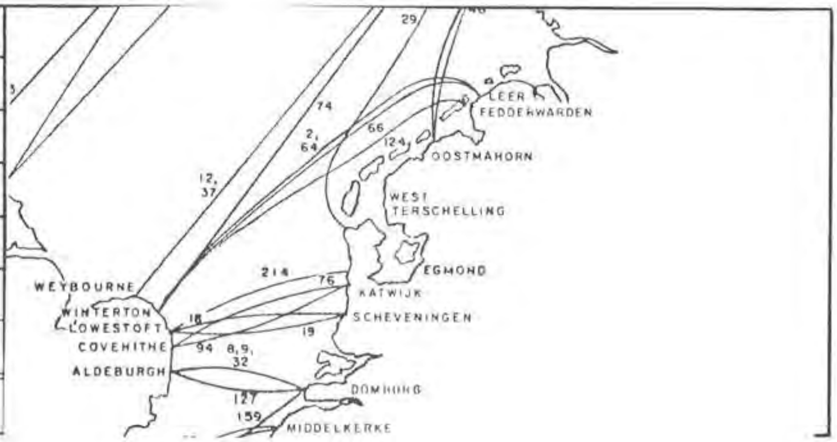
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 now 120 CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables CONSTRUCTION CONTRACTOR BPO

POWER FEED MODE double end NOMINAL VOLTAGE 850/850 SYSTEM CURRENT 0.430 A

TASI TYPE – CIRCUITS USED – CIRCUITS DERIVED – TOTAL CIRCUITS – DATE APPLIED –

COST	$ MILLION
CABLE	0.70
SUBMERGED ELECTRONICS	0.66
TERMINAL AND POWER FEED	0.17
TERMINAL STATIONS	0.22
INSTALLATION	0.11
TOTAL	1.83
SYSTEM DESIGN LIFE	20 years



RETIRED 1976

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **65**

OFFICIAL NAME	Thule-White Bay		
COUNTRY A	Greenland	COUNTRY B	Canada
TERMINUS A	USAFB Thule	TERMINUS B	Hampden, Newfoundland
LANDING POINT A	Thule	LANDING POINT B	Hampden
COORDINATES A	$76^{o}32'$ N x $68^{o}49'$ W	COORDINATES B	$49^{o}32'$ N x $56^{o}52'$ W

OWNER A	U.S. Department of Defense	CIRCUITS HELD	36 h
OWNER B	Canadian Defense Establishment	CIRCUITS HELD	36 h

In 1964 the Cape Dyer-Thule system (No. 35) and the Cape Dyer-White Bay system (No. 47) were withdrawn from Cape Dyer and joined in the sea to become the Thule-White Bay system No. 65.

DATE IN SERVICE 1964 | NATURE OF SERVICE military | CABLE MILES 2020 / 2020 | SINGLE OR TWIN twin | SYSTEM TYPE SB

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.62" 15.7 mm

CABLE MANUFACTURER Simplex Wire & Cable Company | CABLESHIP USED: CYRUS FIELD

REPEATER DESCRIPTION articulated flexible unidirectional | NUMBER OF REPEATERS 54 + 54 | REPEATER SPACING 37.5 nm

REPEATER MANUFACTURER Western Electric Company

NOMINAL TRANSMISSION BANDWIDTH 144+144 kHz | TRANSMISSION FREQUENCIES 20-164+20-164 kHz

NUMBER OF EQUALIZERS 1+1 | EQUALIZATION METHOD adjust cable length; select equalizers

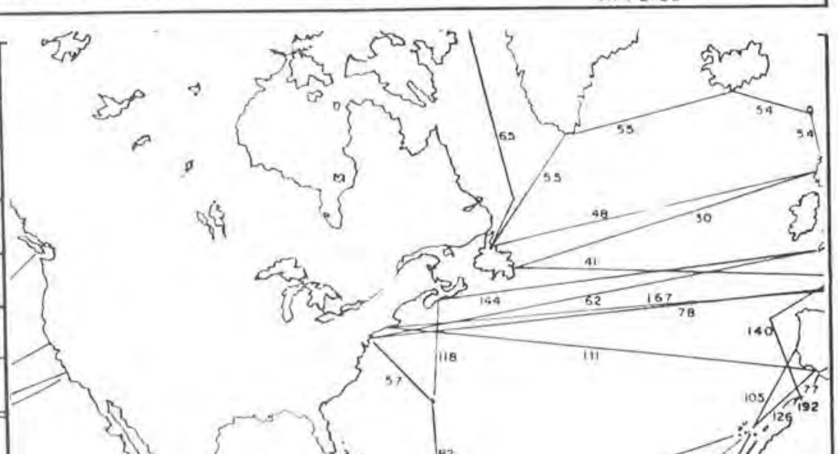
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 36 final 36 | CHANNEL SPACING, INITIAL 4 kHz final 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company | CONSTRUCTION CONTRACTOR Western Electric

POWER FEED MODE double end | NOMINAL VOLTAGE 2300/2300 | SYSTEM CURRENT 0.225 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	20.2
SUBMERGED ELECTRONICS	6.5
TERMINAL AND POWER FEED	1.0
TERMINAL STATIONS	2.0
INSTALLATION	1.0
TOTAL	30.7
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

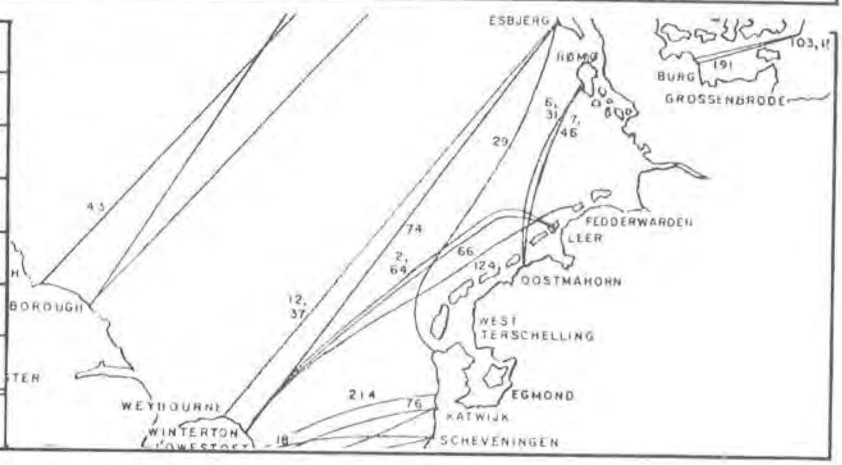
SYSTEM REFERENCE NUMBER **66**

OFFICIAL NAME	Winterton - Borkum 2		
OTHER NAMES	Winterton - Leer 2	Leer-Winterton B	
COUNTRY A	England	COUNTRY B	Federal Republic of Germany
TERMINUS A	Winterton, Norfolk	TERMINUS B	Leer, Ostfriesland
LANDING POINT A	Winterton	LANDING POINT B	Borkum-(Manslagt)
COORDINATES A	52°43' N x 1°41' E	COORDINATES B	53° 37' N x 6°43' E

OWNER A	British Post Office	CIRCUITS HELD	120h
OWNER B	Deutsche Bundespost	CIRCUITS HELD	120h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1964
NATURE OF SERVICE	commercial
CABLE MILES	249
SINGLE OR TWIN	single
SYSTEM TYPE	Q
CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.
CABLESHIPS USED:	ALERT (4) PETER FABER (2)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	20
REPEATER SPACING	11.7 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd.
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz
TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	1
EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 now 120
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.
CONSTRUCTION CONTRACTOR	BPO
POWER FEED MODE	double end
NOMINAL VOLTAGE	850/850
SYSTEM CURRENT	0.430 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.70
SUBMERGED ELECTRONICS	0.66
TERMINAL AND POWER FEED	0.17
TERMINAL STATIONS	0.04
INSTALLATION	0.08
TOTAL	1.65
SYSTEM DESIGN LIFE	20 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

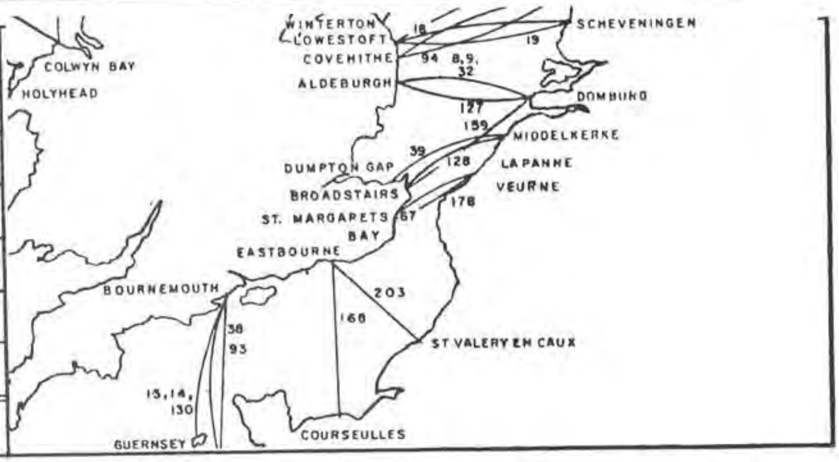
SYSTEM REFERENCE NUMBER **67**

OFFICIAL NAME	St. Margarets Bay - La Panne		
OTHER NAMES	La Panne - St. Margaret's Bay No. 6		
COUNTRY A	England	COUNTRY B	Belgium
TERMINUS A	St. Margaret's Bay, Kent	TERMINUS B	La Panne
LANDING POINT A	St. Margaret's Bay	LANDING POINT B	La Panne
COORDINATES A	51°9' N x 1°24' E	COORDINATES B	51°6' N x 2°35' E

OWNER A	British Post Office	CIRCUITS HELD	420 h
OWNER B	Régie des Télégraphs et des Téléphones	CIRCUITS HELD	420 h
	The previously-laid polyethylene and air-dielectric coaxial cable was raised in two		
	places by IRIS (2) in 1964, and 2 transistorized repeaters were installed.		

DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	48	SINGLE OR TWIN	single	SYSTEM TYPE	S
CABLE DESCRIPTION	armored polyethylene and air coaxial					CABLE SIZE	1.7" 43.2 mm		
CABLE MANUFACTURER	Submarine Cables Limited								
REPEATER DESCRIPTION	monocontainer inflexible bidirectional ~~transistorized~~			NUMBER OF REPEATERS	2	REPEATER SPACING	16 nm		
REPEATER MANUFACTURER	Submarine Cables Limited			CABLESHIP USED:	IRIS (2)				
NOMINAL TRANSMISSION BANDWIDTH	1732+1732 kHz	TRANSMISSION FREQUENCIES	312-2044+2296-4028 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	420	now 420	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries	CONSTRUCTION CONTRACTOR	SCL						
POWER FEED MODE	double end	NOMINAL VOLTAGE	41/41	SYSTEM CURRENT	0.140 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.36
SUBMERGED ELECTRONICS	0.08
TERMINAL AND POWER FEED	0.80
TERMINAL STATIONS	0.02
INSTALLATION	0.06
TOTAL	1.32
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **68**

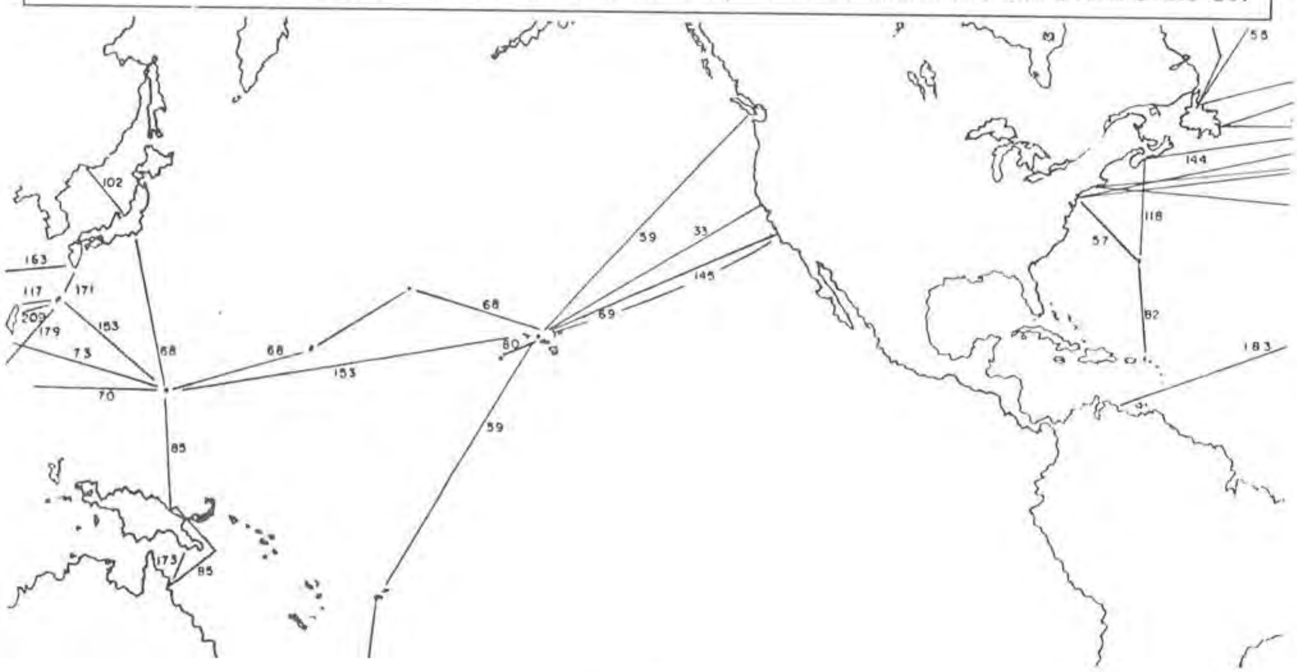
OFFICIAL NAME	Transpacific No. 1	ACRONYM	TPC 1
OTHER NAMES	Hawaii-Guam 1	Japan-Guam	

COUNTRY A	U.S.A. (Hawaii)	COUNTRY B	U.S.A. (Midway)
TERMINUS A	Makaha, Oahu (a)	TERMINUS B	Midway
LANDING POINT A	Makaha	LANDING POINT B	Sand Island
COORDINATES A	21°29' N x 158°13' W	COORDINATES B	28°12' N x 177°23' W

COUNTRY C	U.S.A. (Wake)	COUNTRY D	U.S.A. (Guam)
TERMINUS C	Wake	TERMINUS D	Agana
LANDING POINT C	Wake	LANDING POINT D	Tanguisson Point
COORDINATES C	19°16' N x 166°39' E	COORDINATES D	13°33' N x 144°48' E

COUNTRY E	Japan	COUNTRY F	
TERMINUS E	Ninomiya	TERMINUS F	
LANDING POINT E	Ninomiya	LANDING POINT F	
COORDINATES E	35°17' N x 139°16' E	COORDINATES F	

CABLE MILES	AB 1239	BC 1108	CD 1501	DE 1434			
DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	SD
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Western Electric Co., Standard Telephones & Cables Ltd., and Ocean Cable Co.						



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continued

OWNERS	AD: A.T.&T. Co. and Hawaiian Tel. Co. DE: ATT and Kokusai Denshin Denwa Co. Ltd.
CIRCUITS HELD*	see following page
I R U HOLDERS*	
CIRCUITS HELD*	
LESSEES*	
CIRCUITS LEASED*	

REPEATER DESCRIPTION	monocontainer flexible bidirectional				REPEATER SPACING	20 nm
NUMBER OF REPEATERS	AB 64	BC 58	CD 78	DE 74		
REPEATER MANUFACTURER	Western Electric Company					
NUMBER OF EQUALIZERS	AB 6	BC 5	CD 7	DE 7		
EQUALIZATION METHOD	stepping switch					
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company					
POWER FEED MODE	AD double end			DE single end		
NOMINAL VOLTAGE	5500/5500			4055	SYSTEM CURRENT	0.370 A
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz		TRANSMISSION FREQUENCIES	108-504+660-1052 kHz		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	128	now AD: 142 DE: 138	CHANNEL SPACING, INITIAL	3 kHz	now 3 kHz	
TASI TYPE	A	CIRCUITS USED 37 #	CIRCUITS DERIVED 39 #	TOTAL CIRCUITS N. A.	DATE APPLIED	1966
REMARKS	# between California and Guam		**includes $0.69 M for TASI at Guam			

CONSTRUCTION CONTRACTOR	American Telephone & Telegraph Company	CABLESHIP USED:	LONG LINES

COST	$ MILLION
CABLE	35.38
SUBMERGED ELECTRONICS	18.07
TERMINAL AND POWER FEED **	6.86
TERMINAL STATIONS	3.48
INSTALLATION	4.00
TOTAL	67.79
SYSTEM DESIGN LIFE	24 years

ALLOCATIONS

	SEACOM	HTC	KDD	PLDT	RCAGC	ITTWC	WUI
ATT	20	2	30	14	6		
HTC		1	7	6	9		
ITTWC			10	1		5	
RCAGC			7	2	3		
WUI				1			6
KDD			8				
GMCR						2	
PGC					1		

LEASES

ATT/SEACOM	to	RCAGC	1
"	to	SEACOM	1
ATT/KDD	to	RCAGC	1
ATT/RCAGC	to	RCAGC	1

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **69**

OFFICIAL NAME	Hawaii No. 2	ACRONYM	HAW-2
OTHER NAMES	Hawaii-California 2		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A. (Hawaii)
TERMINUS A	San Luis Obispo, California	TERMINUS B	Makaha, Oahu
LANDING POINT A	San Luis Obispo	LANDING POINT B	Makaha
COORDINATES A	$35^{o}18'$ N x $120^{o}53'$ W	COORDINATES B	$21^{o}29'$ N x $158^{o}13'$ W

OWNER A	American Telephone & Telegraph Company	CIRCUITS HELD	58h
OWNER B	Hawaiian Telephone Company	CIRCUITS HELD	58 h

I R U HOLDERS	ATT/KDD	ATT/PLDT	ATT/RCAGC	ITTWC	RCAGC	WUI	ITTWC/KDD	RCAGC/KDD
CIRCUITS HELD	31	14	6	4	7	4	5	4
IRU HOLDERS	ITTWC/GMCR	ITTWC/WUI	ATT/SEACOM					
CIRCUITS HELD	1	1	8					

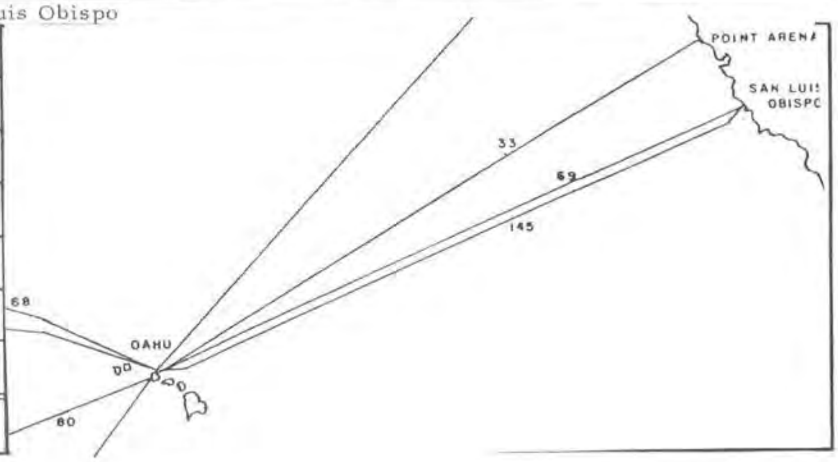
DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	2383	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial			CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURERS	Ocean Cable Co.Ltd. and Western Electric Co.			CABLESHIP USED:	LONG LINES
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	123	REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Western Electric Company				
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz	TRANSMISSION FREQUENCIES	108-504+660-1052 kHz		
NUMBER OF EQUALIZERS	12	EQUALIZATION METHOD	stepping switch		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	128 now 142	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT		
POWER FEED MODE	double end	NOMINAL VOLTAGE	3400/3400	SYSTEM CURRENT	0.370 A

TASI TYPE A	CIRCUITS USED	37	CIRCUITS DERIVED	34	TOTAL CIRCUITS	71	DATE APPLIED	1965	

*includes $0.69M for TASI at San Luis Obispo

COST	$ MILLION
CABLE	13.67
SUBMERGED ELECTRONICS	7.81
TERMINAL AND POWER FEED	2.42
TERMINAL STATIONS *	5.20
INSTALLATION	2.20
TOTAL	31.30
SYSTEM DESIGN LIFE	24 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **70**

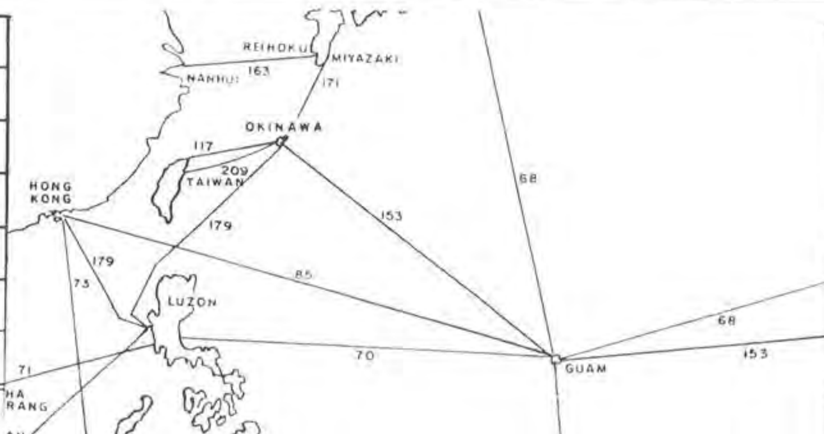
OFFICIAL NAME	Guam-Philippines	ACRONYM	TPC 1
OTHER NAMES	Agana-Baler Trans Pacific Cable 1		
COUNTRY A	U.S.A. (Guam)	COUNTRY B	Philippine Republic
TERMINUS A	Agana	TERMINUS B	Baler, Luzon
LANDING POINT A	Tanguisson Point	LANDING POINT B	Baler
COORDINATES A	13°33' N x 144°48' E	COORDINATES B	15°46' N x 121°34' E

OWNER A	American Telephone & Telegraph Company	CIRCUITS HELD	36h
OWNER B	Philippine Long Distance Telephone Company	CIRCUITS HELD	4+36h
	See separate page		

DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	1468	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd., Western Electric Co., and Ocean Cable Co.		
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	76
REPEATER SPACING	20 nm		
REPEATER MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz	TRANSMISSION FREQUENCIES	108-504+660-1052 kHz
NUMBER OF EQUALIZERS	7	EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	128 now 128	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CABLESHIP USED:	LONG LINES
POWER FEED MODE	single end	NOMINAL VOLTAGE	4200
SYSTEM CURRENT	0.370 A		
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -
DATE APPLIED	-		

COST	$ MILLION
CABLE	10.99
SUBMERGED ELECTRONICS	4.66
TERMINAL AND POWER FEED	4.66
TERMINAL STATIONS	1.40
INSTALLATION	1.60
TOTAL	23.31
SYSTEM DESIGN LIFE	24 years



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continued

ALLOCATIONS

	RCAGC	PLDT	ATT	HTC	ITTWC	KDD	WUI	GMCR	PGC	ITA	ETPI
ATT											
PLDT		4	36	12	3		8				
RCAGC		1							18		
ITTWC					2			8			
KDD						8		4	15		
PGC									6		
ETPI											1
ITA	1		12	1	1		1				

OUT OF SERVICE 1975

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **71**

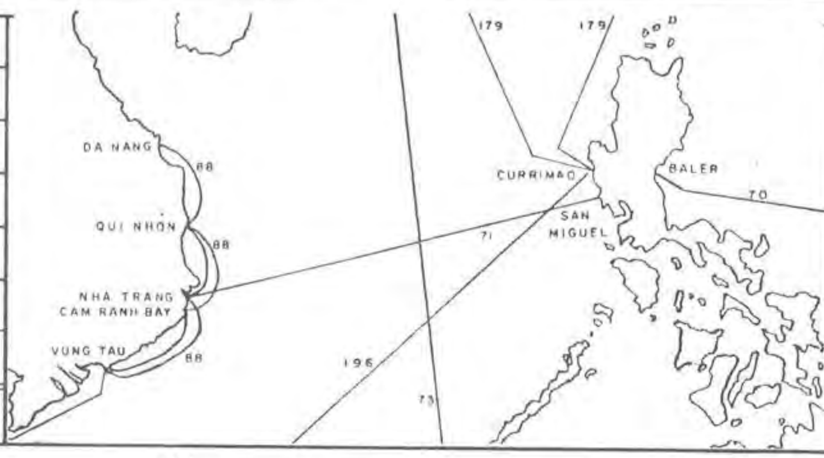
OFFICIAL NAME	Philippines - Viet Nam		
OTHER NAMES	Wet Wash A 484-N Subsystem A		
COUNTRY A	Philippine Republic	COUNTRY B	Viet Nam
TERMINUS A	U.S. Naval Station, San Miguel	TERMINUS B	Nha Trang
LANDING POINT A	San Miguel	LANDING POINT B	Nha Trang Bay
COORDINATES A	15°18' N x 120°0' E	COORDINATES B	12°14' N x 109°12' E

OWNER (when built) U.S. Government — **CIRCUITS HELD** all

The Viet Nam end of the system was abandoned in 1975. In 1980 the U.S. Government Surplus Property Agency offered the remaining portion of the system for sale by international tender. The offering was acquired by Eastern Telecommunications Philippines Incorporated.

DATE IN SERVICE	1964
NATURE OF SERVICE	military
CABLE MILES	696
SINGLE OR TWIN	single
SYSTEM TYPE	Z60S
CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Simplex Wire and Cable Company
CABLESHIP USED:	NEPTUN(3)
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	41
REPEATER SPACING	17 nm
REPEATER MANUFACTURER	Felten & Guilleaume Carlswerk AG
CONSTRUCTION CONTRACTOR	United States Underseas Cable Corp.
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz
TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NUMBER OF EQUALIZERS	3
EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Felten & Guilleaume Fernmeldeanlagen GmbH
POWER FEED MODE	double end
NOMINAL VOLTAGE	3000
SYSTEM CURRENT	0.426 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	2.5
SUBMERGED ELECTRONICS	1.8
TERMINAL AND POWER FEED	.8
TERMINAL STATIONS	1.1
INSTALLATION	1.8
TOTAL	8.0
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **72**

OFFICIAL NAME	Florida-St. Thomas No. 1	ACRONYM	ST T 1
OTHER NAMES	Vero Beach-Magens Bay		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A. (Virgin Islands)
TERMINUS A	Vero Beach, Florida	TERMINUS B	Magens Bay, St. Thomas
LANDING POINT A	Vero Beach	LANDING POINT B	Magens Bay
COORDINATES A	27°38' N x 80°21' W	COORDINATES B	18°22' N x 64°56' W

OWNER A	American Telephone and Telegraph Company				CIRCUITS HELD	82 h
OWNER B	ITT Communications, Inc.-Virgin Islands				CIRCUITS HELD	82 h
I R U HOLDERS	CANTV with ATT,	RCAGC,	ITTWC,	WUI;	ITTCVI with WUI	
CIRCUITS HELD	41	1	1	1	3	
IRU HOLDERS	WUI	JITL	RCAGC	OWNER B	ITTCVI	6 h
CIRCUITS HELD	1	2	4	OWNER C	ITTWC	6 h

DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	1179	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.00" 25.4 mm

CABLE MANUFACTURER Western Electric Co., Standard Telephones & Cables Ltd., & Ocean Cable Co.

REPEATER DESCRIPTION monocontainer flexible bidirectional — NUMBER OF REPEATERS 61 — REPEATER SPACING 20 nm

REPEATER MANUFACTURER Western Electric Company — CABLESHIP USED: LONG LINES

NOMINAL TRANSMISSION BANDWIDTH 384+384 kHz — TRANSMISSION FREQUENCIES 108-504+660-1052 kHz

NUMBER OF EQUALIZERS 5 — EQUALIZATION METHOD stepping switch

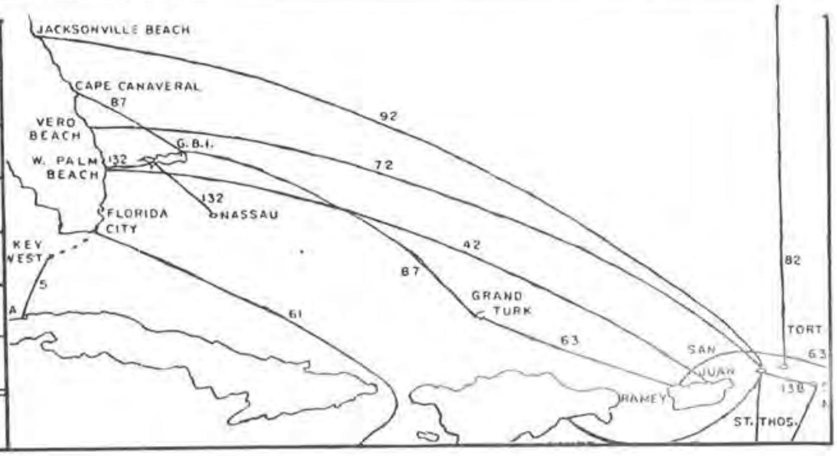
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 128 now 142 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company — CONSTRUCTION CONTRACTOR ATT

POWER FEED MODE single end — NOMINAL VOLTAGE 3360 — SYSTEM CURRENT 0.370 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	8.85
SUBMERGED ELECTRONICS	3.95
TERMINAL AND POWER FEED	2.16
TERMINAL STATIONS	0.94
INSTALLATION	1.00
TOTAL	16.90
SYSTEM DESIGN LIFE	24 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **73** A

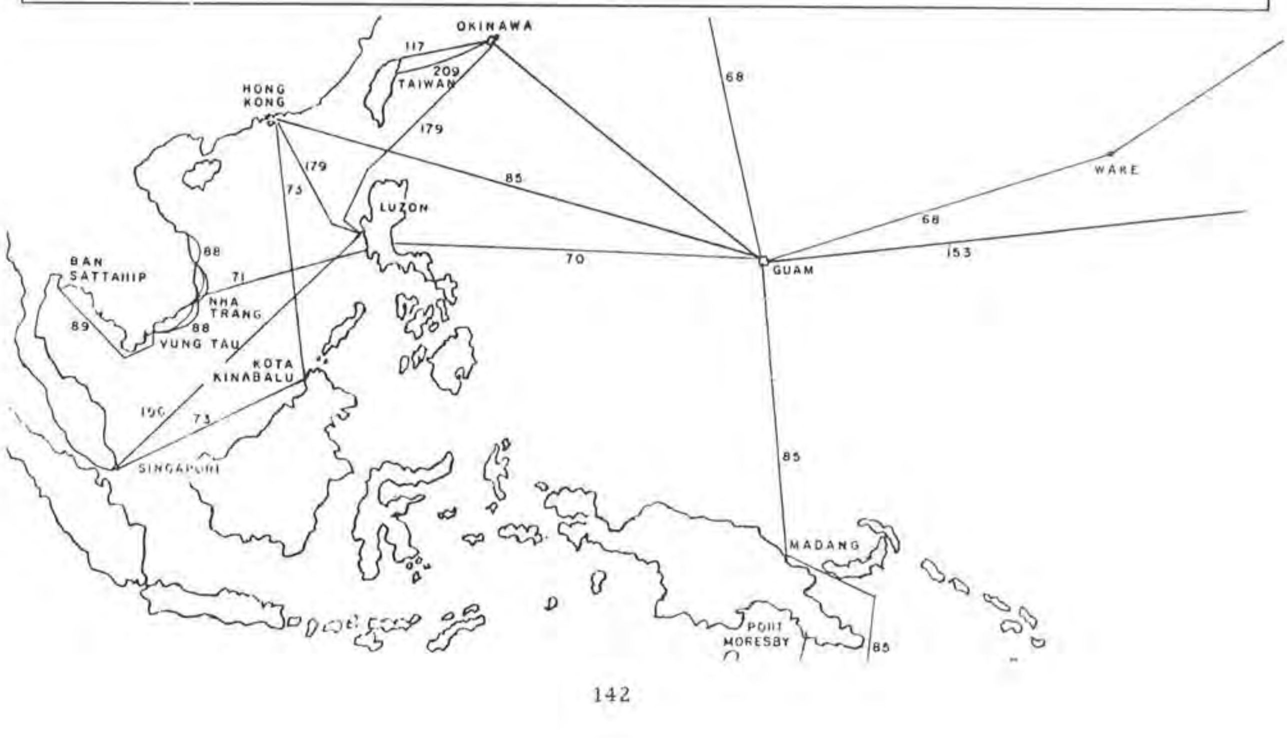
OFFICIAL NAME	Southeast Asia Communications Cable (Singapore-Guam)	ACRONYM	SEACOM
OTHER NAMES			

COUNTRY A	Republic of Singapore	COUNTRY B	Malaysia
TERMINUS A	Katong	TERMINUS B	Kota Kinabalu, Sabah
LANDING POINT A	East Coast Park	LANDING POINT B	Kota Kinabalu
COORDINATES A	1°13' N x 103°53' E	COORDINATES B	5°58' N x 116°8' E

COUNTRY C	Hong Kong	COUNTRY D	U.S.A. (Guam)
TERMINUS C	Deep Water Bay	TERMINUS D	Tumon Bay
LANDING POINT C	Deep Water Bay	LANDING POINT D	Tumon Bay
COORDINATES C	22°28' N x 114°6' E	COORDINATES D	13°31' N x 144°48' E

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 867	B C 1102	C D 2111				
DATE IN SERVICE	1965	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	N Mk VII
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Submarine Cables Limited and Standard Telephones & Cables Limited						



RETIRED 1983

73 A

continued

OWNERS	*O.T.C.A., Adm. of Tel. (M), Telcom. Auth. (S), C.&W., C.O.T.C., N.Z.P.O.
CIRCUITS HELD	
I R U HOLDERS	ATT: A-C C-D KDD: A-C C-D
CIRCUITS HELD	8h 30h 3 + 13/22 14
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING 26 nm
NUMBER OF REPEATERS	A B 43 B C 46 C D 84
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd. and Submarine Cables Ltd.
NUMBER OF EQUALIZERS	A B 3 B C 4 C D 6
EQUALIZATION METHOD	adjusted on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited and AEI Limited
POWER FEED MODE	A B double end B C double end C D double end
NOMINAL VOLTAGE	2200/2200 2300/2300 4200/4200 — SYSTEM CURRENT 0.415 A
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz — TRANSMISSION FREQUENCIES 60-300+360-608 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	80 now 82 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	System A stations: AB Singapore, BC Kota Kinabalu, CD Hong Kong

CONSTRUCTION CONTRACTOR	Cable & Wireless Limited

COST	$ MILLION
CABLE	19
SUBMERGED ELECTRONICS	11
TERMINAL AND POWER FEED	3
TERMINAL STATIONS	3
INSTALLATION	3
TOTAL	39
SYSTEM DESIGN LIFE	20 years

CABLESHIPS USED:

MERCURY, MONARCH (4)

CABLE ENTERPRISE

RECORDER (3)

* Overseas Telecommunications Commission, Australia
Administration of Telecommunications, Malaysia
Telecommunications Authority of Singapore
Cable & Wireless Limited
Canadian Overseas Telecommunications Corporation (now Teleglobe Canada)
New Zealand Post Office

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **73** B

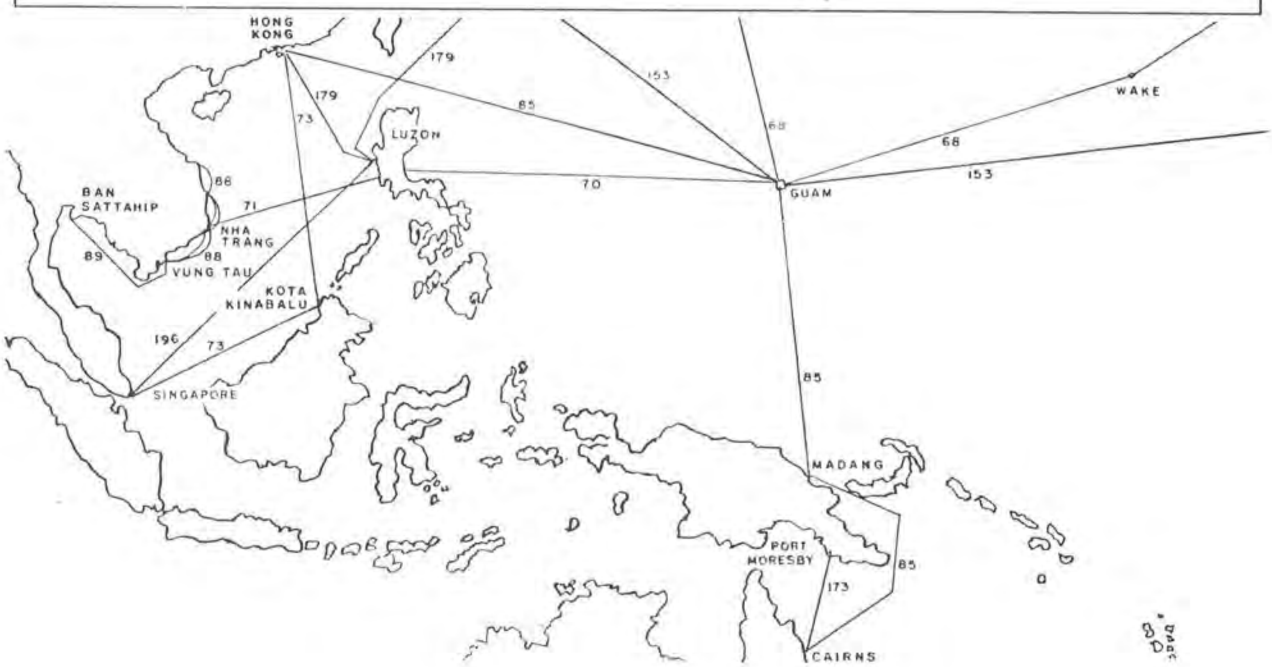
OFFICIAL NAME	Southeast Asia Communications Cable (Sydney - Guam)	ACRONYM	SEACOM
OTHER NAMES	SEACOM		

COUNTRY A	Australia	COUNTRY B	Papua (Northeast New Guinea)
TERMINUS A	Cairns, Queensland	TERMINUS B	Madang
LANDING POINT A	Cairns	LANDING POINT B	Madang
COORDINATES A	$17^{o}8'$ S x $145^{o}29'$ E	COORDINATES B	$5^{o}7'$ S x $146^{o}0'$ E

COUNTRY C	U.S.A. (Guam)	COUNTRY D	
TERMINUS C	Tumon Bay	TERMINUS D	
LANDING POINT C	Tumon Bay	LANDING POINT D	
COORDINATES C	$13^{o}31'$ N x $144^{o}48'$ E	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 1614	B C 1391					
DATE IN SERVICE	1967	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	U Mk I
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Submarine Cables Limited and Standard Telephones & Cables Ltd.						



OWNERS	*O.T.C.(A), Adm. of Tel. (M), Adm. of Tel. (S), C.&W., C.O.T.C., N.Z.P.O.		
CIRCUITS HELD			
I R U HOLDERS	ATT	ATT/OTC	KDD
CIRCUITS HELD	32	42	5
LESSEES	none		
CIRCUITS LEASED	-		

REPEATER DESCRIPTION	monocontainer inflexible bidirectional; REPEATER SPACING 17 nm
NUMBER OF REPEATERS	A B 98; B C 82
REPEATER MANUFACTURER	Submarine Cables Ltd. and Standard Telephones & Cables Ltd.
NUMBER OF EQUALIZERS	A B 9; B C 8
EQUALIZATION METHOD	adjusted on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	A B double end; B C double end
NOMINAL VOLTAGE	5200/5200; 4400/4400; SYSTEM CURRENT 0.415 A
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz; TRANSMISSION FREQUENCIES 60-552 + 672-1164, and 554-572 + 1166-1184
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160; now 166; CHANNEL SPACING, INITIAL 3 kHz; now 3 kHz
TASI TYPE	B / A***; CIRCUITS USED 38 / 37; CIRCUITS DERIVED 109 / 37; TOTAL CIRCUITS 147** / 74; DATE APPLIED 1975 / 1978
REMARKS	System A stations: AB-Cairns BC-Madang; This system is considered as an addition to the 1965 Singapore-Guam system

CONSTRUCTION CONTRACTOR	Cable & Wireless Limited	CABLESHIPS USED:	MONARCH (4) MERCURY

**This is pro-rata. A Vancouver-Sydney TASI B uses 33 COMPAC bearers plus 38 SEACOM-TPC 2 - HAW 3 bearers to supply 274 inlets. Of these, 33/71 x 274=127 may be ascribed to COMPAC, which thus carries 82-33=49 hard-wire circuits, 33 TASI-and-through circuits, and 94 TASI-only circuits, for a grand total of 176 circuits.

COST	$ MILLION
CABLE	14.7
SUBMERGED ELECTRONICS	9.3
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	1.2
INSTALLATION	1.8
TOTAL	27.8
SYSTEM DESIGN LIFE	20 years

***This TASI is in fact Sydney-Guam. This cable thus carries 166-38=91 hard-wire circuits, 147 TASI B circuits (of which 109 are TASI-only), and 74 TASI A circuits (of which 37 are TASI-only), for a grand total of 312 circuits.

*Overseas Telecommunications Commission (Australia)
Administration of Telecommunications, Malaysia
Administration of Telecommunications, Singapore
Cable & Wireless Limited
Canadian Overseas Telecommunications Corporation, Now Teleglobe Canada
New Zealand Post Office

RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **74**

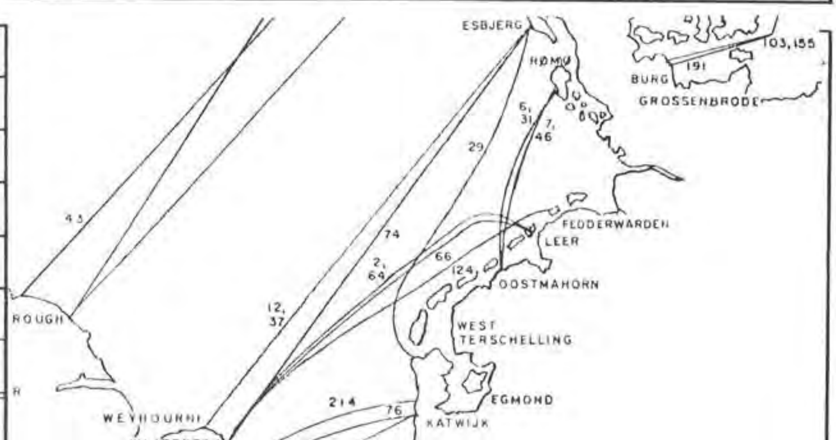
OFFICIAL NAME	Winterton-Maade		
OTHER NAMES	Winterton-Fanø Maade-Winterton No. 1 Maade-Winterton A		
COUNTRY A	England	COUNTRY B	Denmark
TERMINUS A	Winterton, Norfolk	TERMINUS B	Maade
LANDING POINT A	Winterton	LANDING POINT B	Fanø
COORDINATES A	$52^{\circ}43'$ N x $1^{\circ}41'$ E	COORDINATES B	$55^{\circ}22'$ N x $8^{\circ}25'$ E

OWNER A	British Post Office	CIRCUITS HELD	120h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	120h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	298	SINGLE OR TWIN	single	SYSTEM TYPE	Q

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIPS USED:	ALERT (4) PETER FABER (2)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	24 — REPEATER SPACING 11.7 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 now 120	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE 1100/1100	SYSTEM CURRENT 0.415 A
TASI TYPE - CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST	$ MILLION
CABLE	1.00
SUBMERGED ELECTRONICS	0.75
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	0.03
INSTALLATION	0.10
TOTAL	2.13
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

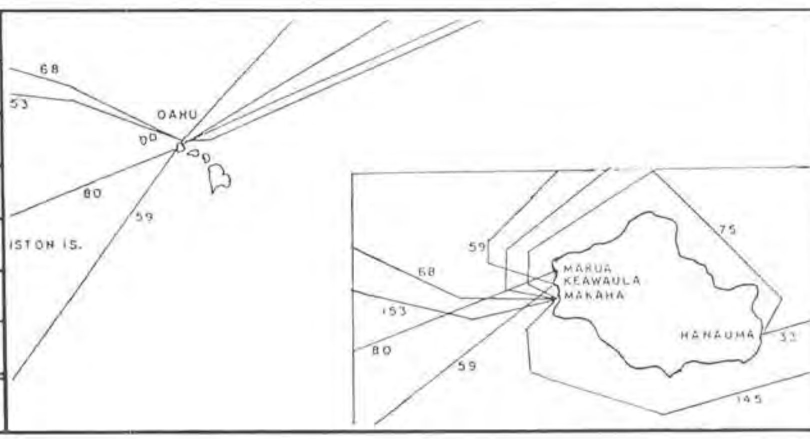
SYSTEM REFERENCE NUMBER **75**

OFFICIAL NAME	Oahu Submarine Tie		
OTHER NAMES	Makaha-Hanauma Bay	OAHU TIE	
COUNTRY A	U.S.A. (Hawaii)	COUNTRY B	U.S.A. (Hawaii)
TERMINUS A	Makaha, Oahu	TERMINUS B	Hanauma Bay, Oahu
LANDING POINT A	Makaha	LANDING POINT B	Hanauma Bay
COORDINATES A	21°29' N x 158°13' W	COORDINATES B	21°16' N x 157°42' W

Jointly owned by American Telephone & Telegraph Co. and Hawaiian Tel. Co.		CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1964
NATURE OF SERVICE	commercial
CABLE MILES	49
SINGLE OR TWIN	single
SYSTEM TYPE	SD
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Western Electric Company and Standard Telephones & Cables Ltd.
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	2
REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Western Electric Company
CABLESHIP USED:	LONG LINES
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz
TRANSMISSION FREQUENCIES	108-504+660-1052 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	96 now 96
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Co.
CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	single end
NOMINAL VOLTAGE	110
SYSTEM CURRENT	0.370 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.96
SUBMERGED ELECTRONICS	0.10
TERMINAL AND POWER FEED	0.96
TERMINAL STATIONS	0.75
INSTALLATION	0.13
TOTAL	2.90
SYSTEM DESIGN LIFE	24 years



RETIRED 1979

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **76**

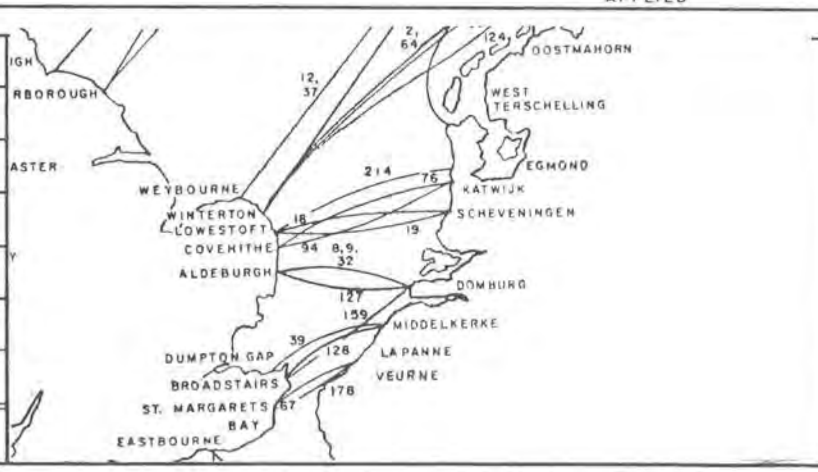
OFFICIAL NAME	Covehithe-Katwijk No. 1		
OTHER NAMES	Covehithe-Katwijk A		
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Covehithe, Suffolk	TERMINUS B	Oegstgeest, South Holland
LANDING POINT A	Covehithe	LANDING POINT B	Katwijk
COORDINATES A	52°22' N x 1°42' E	COORDINATES B	52°12' N x 4°24' E

OWNER A	British Post Office	CIRCUITS HELD	120h
OWNER B	Administration of PTT	CIRCUITS HELD	120h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1964	NATURE OF SERVICE	commercial	CABLE MILES	109	SINGLE OR TWIN	single	SYSTEM TYPE	Q

CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited
CABLESHIP USED:	ALERT (4)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	8
REPEATER SPACING	11.9 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz
TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 final 120
CHANNEL SPACING, INITIAL	4 kHz final 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	425/425
SYSTEM CURRENT	0.415 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.35
SUBMERGED ELECTRONICS	0.30
TERMINAL AND POWER FEED	0.05
TERMINAL STATIONS	-
INSTALLATION	0.10
TOTAL	0.80
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

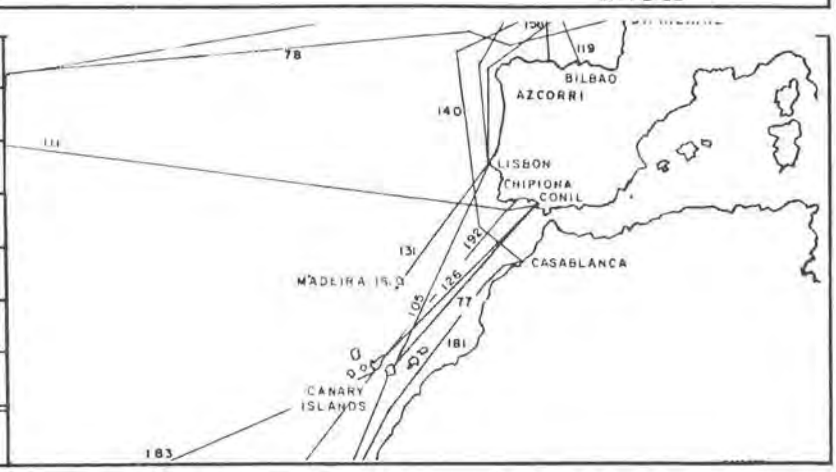
SYSTEM REFERENCE NUMBER **77**

OFFICIAL NAME	Peninsula - Canary Islands No. 1	ACRONYM	PENCAN 1
OTHER NAMES	San Fernando - Santa Cruz, Tenerife		
COUNTRY A	Spain (mainland)	COUNTRY B	Spain (Canary Islands)
TERMINUS A	San Fernando, Cádiz	TERMINUS B	Santa Cruz de Tenerife
LANDING POINT A	San Fernando Beach	LANDING POINT B	San Juan Beach
COORDINATES A	36°27' N x 6°15' W	COORDINATES B	28°27' N x 16°15' W

OWNER	Compañía Telefónica Nacional de España	CIRCUITS HELD	all
I R U HOLDERS	South Atlantic Cable Company		
CIRCUITS HELD	16		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1965
NATURE OF SERVICE	commercial
CABLE MILES	749
SINGLE OR TWIN	single
SYSTEM TYPE	NA (U Mk I)
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited
CABLESHIP USED:	JOHN W MACKAY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	45
REPEATER SPACING	17 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz
TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	3
EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160 now 160
CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	2500/2500
SYSTEM CURRENT	0.430 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	3.5
SUBMERGED ELECTRONICS	2.2
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	1.4
INSTALLATION	0.4
TOTAL	7.9
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **78**

OFFICIAL NAME	Transatlantic No. 4	ACRONYM	TAT-4
OTHER NAMES	Tuckerton-St. Hilaire de Riez		
COUNTRY A	U.S.A.	COUNTRY B	France
TERMINUS A	Tuckerton, N. J.	TERMINUS B	St. Hilaire de Riez, Vendee
LANDING POINT A	Beach Haven	LANDING POINT B	St. Hilaire de Riez
COORDINATES A	39°33' N x 74°15' W	COORDINATES B	46°44' N x 1°59' W

OWNER	see following page	CIRCUITS HELD	
		CIRCUITS HELD	
I R U HOLDERS	see following page		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED	-		

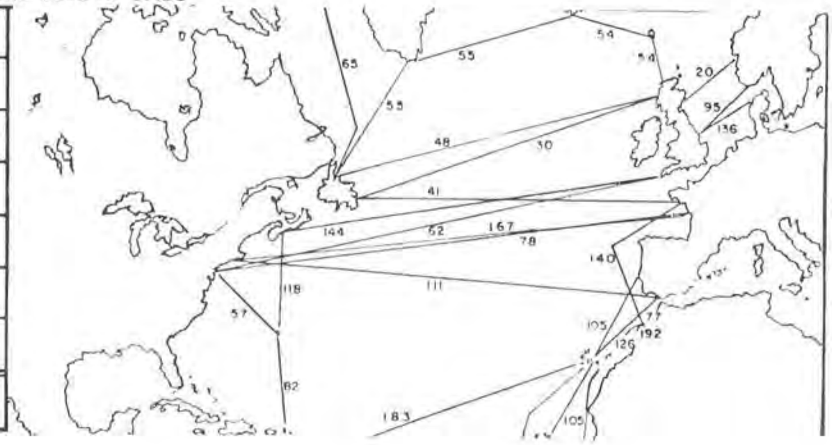
DATE IN SERVICE	1965	NATURE OF SERVICE	commercial	CABLE MILES	3599	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Western Electric Co., Câbles de Lyon, Norddeutsche Seekabelwerke AG		
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	186
REPEATER SPACING	20 nm		
REPEATER MANUFACTURER	Western Electric Company	CABLESHIPS USED:	LONG LINES, MARCEL BAYARD
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz	TRANSMISSION FREQUENCIES	108-504+660-1052 kHz
NUMBER OF EQUALIZERS	18	EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	128 now 138	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	5100/5100
SYSTEM CURRENT	0.370 A		

TASI TYPE *-		CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

*13 circuits of TAT-4 are used on the TAT-2 TASI

COST	$ MILLION
CABLE	29.77
SUBMERGED ELECTRONICS	12.48
TERMINAL AND POWER FEED	4.03
TERMINAL STATIONS	2.11
INSTALLATION	2.01
TOTAL	50.40
SYSTEM DESIGN LIFE	24 years



ALLOCATIONS

	ATT	FTCC	ITTWC	RCAGC	WUI
France	19	3	8	6	4
DBP	25		11	7	4
ITALCABLE	4		1	1	1
Austria	2				
Switzerland	3		2	4	2
Belgium	3		1	1	1
Netherlands	3			1	1
Norway	1			1	
Denmark	1		1		
Spain	1		1		
Israel	1		1		1
Sweden	1				1
Tunisia			1		

79 Unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **80**

OFFICIAL NAME	Hawaii-Johnston Island		
OTHER NAMES	484-N Subsystem C Wet Wash C		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A.
TERMINUS A	Makua, Oahu, Hawaii	TERMINUS B	U.S.A.F.S. Johnston Is.
LANDING POINT A	Makua	LANDING POINT B	Johnston Is.
COORDINATES A	21°32' N x 158°14' W	COORDINATES B	16°36' N x 169°26' W

OWNER	U.S. Government	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1966	NATURE OF SERVICE	military	CABLE MILES	769	SINGLE OR TWIN	single	SYSTEM TYPE	Z60S

CABLE DESCRIPTION: armored polyethylene coaxial — CABLE SIZE: 0.62" 15.7 mm

CABLE MANUFACTURER: Simplex Wire & Cable Company — CABLESHIP USED: NEPTUN (3)

REPEATER DESCRIPTION: monocontainer flexible bidirectional — NUMBER OF REPEATERS: 45 — REPEATER SPACING: 17 nm

REPEATER MANUFACTURER: Felten & Guilleaume Carlswerk AG — CONSTRUCTION CONTRACTOR: United States Underseas Cable Corp.

NOMINAL TRANSMISSION BANDWIDTH: 240+240 kHz — TRANSMISSION FREQUENCIES: 24-264+312-552 kHz

NUMBER OF EQUALIZERS: 3 — EQUALIZATION METHOD: designed and constructed on board

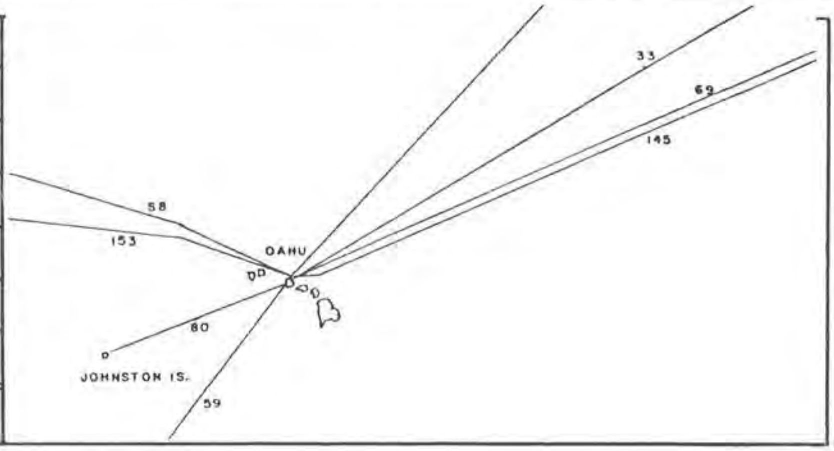
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 60 now 60 — CHANNEL SPACING, INITIAL: 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: F&G Fernmeldeanlagen GmbH

POWER FEED MODE: double end — NOMINAL VOLTAGE: 3000/3000 — SYSTEM CURRENT: 0.426 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED -- TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	3.88
SUBMERGED ELECTRONICS	2.65
TERMINAL AND POWER FEED	0.42
TERMINAL STATIONS	0.41
INSTALLATION	0.60
TOTAL	7.96
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

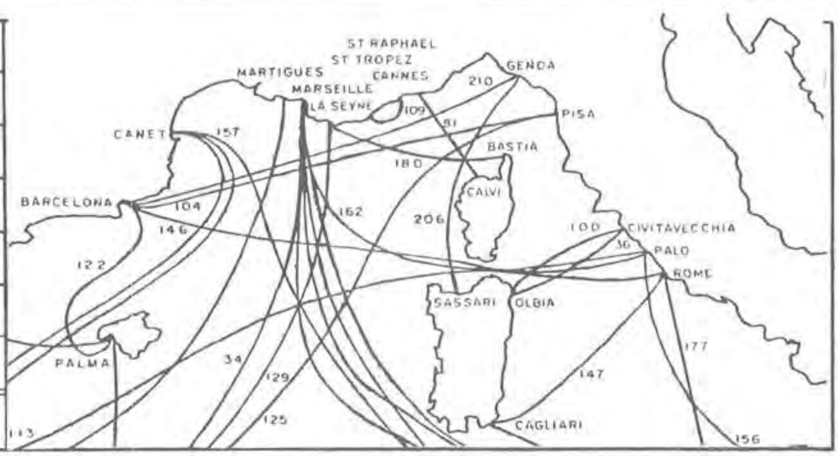
SYSTEM REFERENCE NUMBER **81**

OFFICIAL NAME	Cannes-Ile Rousse		
OTHER NAMES	France-Corsica		
COUNTRY A	France	COUNTRY B	France (Corsica)
TERMINUS A	Cannes, Alpes Maritimes	TERMINUS B	Ile Rousse
LANDING POINT A	Cannes	LANDING POINT B	Ile Rousse
COORDINATES A	$43^{o}32'$ N x $7^{o}03'$ E	COORDINATES B	$42^{o}38'$ N x $8^{o}54'$ E

OWNER	Administration of Posts and Telecommunications	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1966
NATURE OF SERVICE	commercial
CABLE MILES	106
SINGLE OR TWIN	single
SYSTEM TYPE	SD
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon
CABLESHIP USED:	MARCEL BAYARD
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	5
REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz
TRANSMISSION FREQUENCIES	108-554+660-1052 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	96 now 96
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Cie. Industrielle de Télécommunications
CONSTRUCTION CONTRACTOR	CIT
POWER FEED MODE	single end
NOMINAL VOLTAGE	400
SYSTEM CURRENT	0.325 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.6
SUBMERGED ELECTRONICS	0.3
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.4
INSTALLATION	0.3
TOTAL	2.0
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **82**

OFFICIAL NAME	Tortola - Bermuda		
OTHER NAMES			
COUNTRY A	Tortola, B.V.I.	COUNTRY B	Bermuda, B.C.C.
TERMINUS A	Chalwell	TERMINUS B	The Flatts Village
LANDING POINT A	Brewers Bay	LANDING POINT B	Devonshire Bay
COORDINATES A	18°25' N x 64°37' W	COORDINATES B	32°18' N x 64°44' W

OWNER	Cable and Wireless Limited
I R U HOLDERS	
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

DATE IN SERVICE	1966	NATURE OF SERVICE	commercial	CABLE MILES	902	SINGLE OR TWIN	single	SYSTEM TYPE	N MkVIII

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	35	REPEATER SPACING	26.3 nm

REPEATER MANUFACTURER	Submarine Cables Ltd. and Standard Telephones & Cables Ltd.

NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	60-300+360-608 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	adjusted on board

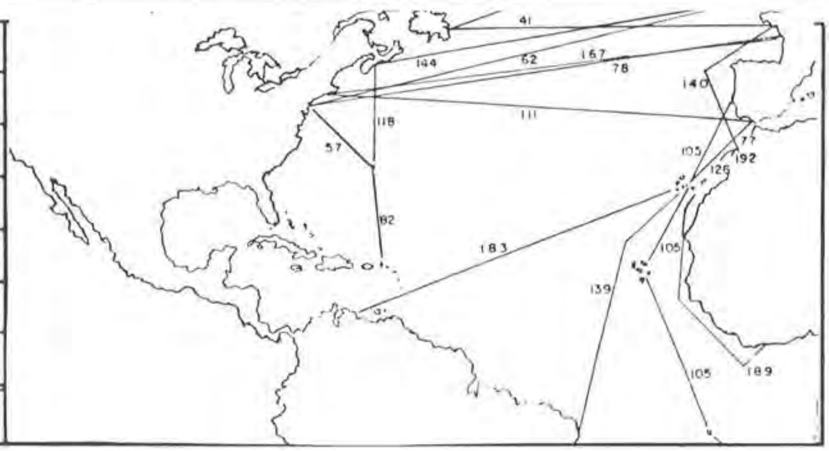
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	80	now 80	CHANNEL SPACING, INITIAL	3 kHz	now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries Ltd.	CONSTRUCTION CONTRACTOR	C&W

POWER FEED MODE	single end	NOMINAL VOLTAGE	3600	SYSTEM CURRENT	0.415 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	4.22
SUBMERGED ELECTRONICS	1.71
TERMINAL AND POWER FEED	0.28
TERMINAL STATIONS	0.38
INSTALLATION	0.60
TOTAL	7.19
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **83**

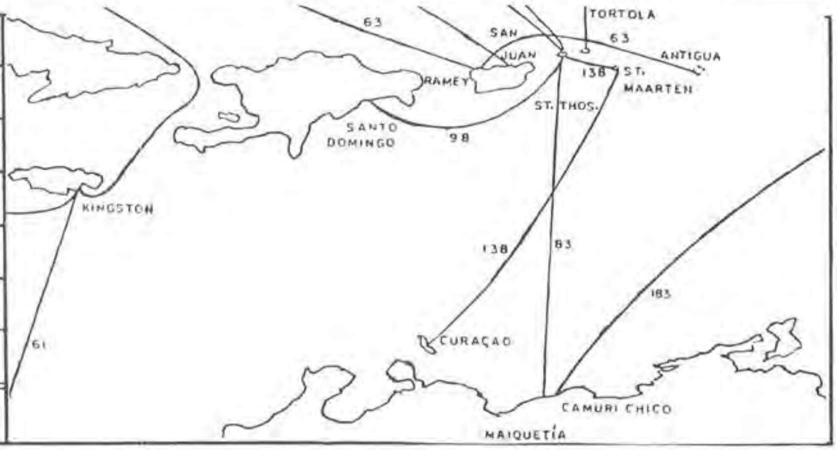
OFFICIAL NAME	St. Thomas-Venezuela		
OTHER NAMES	Maiquetía-Magens Bay		
COUNTRY A	Venezuela	COUNTRY B	U.S.A. (Virgin Islands)
TERMINUS A	Maiquetía	TERMINUS B	Magens Bay, St. Thomas
LANDING POINT A	Punta de Mulatos, Vargas	LANDING POINT B	Magens Bay
COORDINATES A	10°36' N x 66°55' W	COORDINATES B	18°22' N x 64°56' W

OWNER A	Compañía Anónima Nacional de Teléfonos de Venezuela	CIRCUITS HELD	83h
OWNER B	American Telephone & Telegraph Company	CIRCUITS HELD	55h
I R U HOLDERS	CANTV with RCAGC, ITTWC, CTNE, ITTCVI, WUI, CDT		
CIRCUITS HELD	5 3 2 12 2 4		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1966	NATURE OF SERVICE	commercial	CABLE MILES	545	SINGLE OR TWIN	single	SYSTEM TYPE	N Mk VIII

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.	CABLESHIP USED:	ALERT (4)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	22
REPEATER SPACING	26 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd.		
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	60-300+360-608 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	80 now 83	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	single end	NOMINAL VOLTAGE	2300
SYSTEM CURRENT	0.415 A		
TASI TYPE - CIRCUITS USED	-	CIRCUITS DERIVED	-
TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	2.9
SUBMERGED ELECTRONICS	1.0
TERMINAL AND POWER FEED	1.5
TERMINAL STATIONS	0.3
INSTALLATION	0.5
TOTAL	6.2
SYSTEM DESIGN LIFE	20 years



84)
85) unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **86**

OFFICIAL NAME	Kristiansand-Thisted 2		
OTHER NAMES			
COUNTRY A	Norway	COUNTRY B	Denmark
TERMINUS A	Kristiansand	TERMINUS B	Thisted, Thy
LANDING POINT A	Kristiansand	LANDING POINT B	Klitmøller
COORDINATES A	58°10' N x 08°01' E	COORDINATES B	57°3' N x 8°30' E

OWNER A	Administration of Telecommunications	CIRCUITS HELD	480 h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	480 h
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE 1967 · NATURE OF SERVICE commercial · CABLE MILES 80 · SINGLE OR TWIN single · SYSTEM TYPE T Mk 1

CABLE DESCRIPTION armored polyethylene coaxial · CABLE SIZE 0.935" 23.7 mm

CABLE MANUFACTURER Submarine Cables Limited · CABLESHIP USED: MONARCH(4)

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized · NUMBER OF REPEATERS 10 · REPEATER SPACING 7.5 nm

REPEATER MANUFACTURER Submarine Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz · TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS none · EQUALIZATION METHOD –

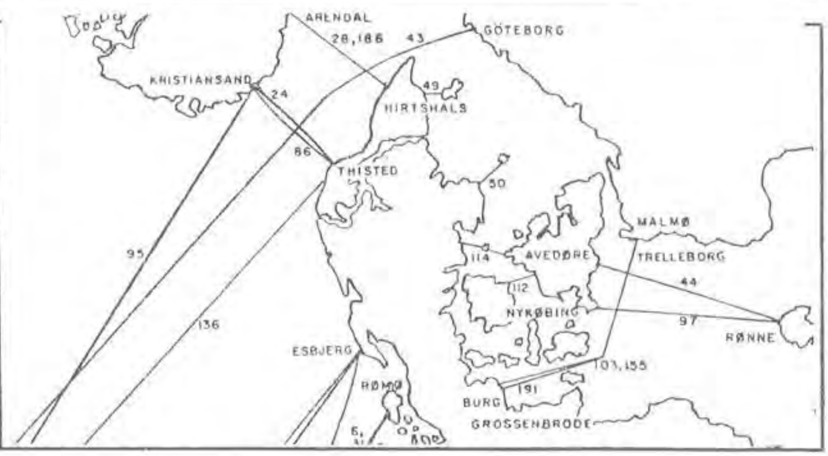
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 · CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Associated Electrical Industries Ltd. · Construction Contractor SCL

POWER FEED MODE double end · NOMINAL VOLTAGE 110/110 · SYSTEM CURRENT 0.150 A

TASI TYPE – · CIRCUITS USED – · CIRCUITS DERIVED – · TOTAL CIRCUITS – · DATE APPLIED –

COST	$ MILLION
CABLE	0.38
SUBMERGED ELECTRONICS	0.42
TERMINAL AND POWER FEED	0.39
TERMINAL STATIONS	0.40
INSTALLATION	0.10
TOTAL	1.69
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **87**

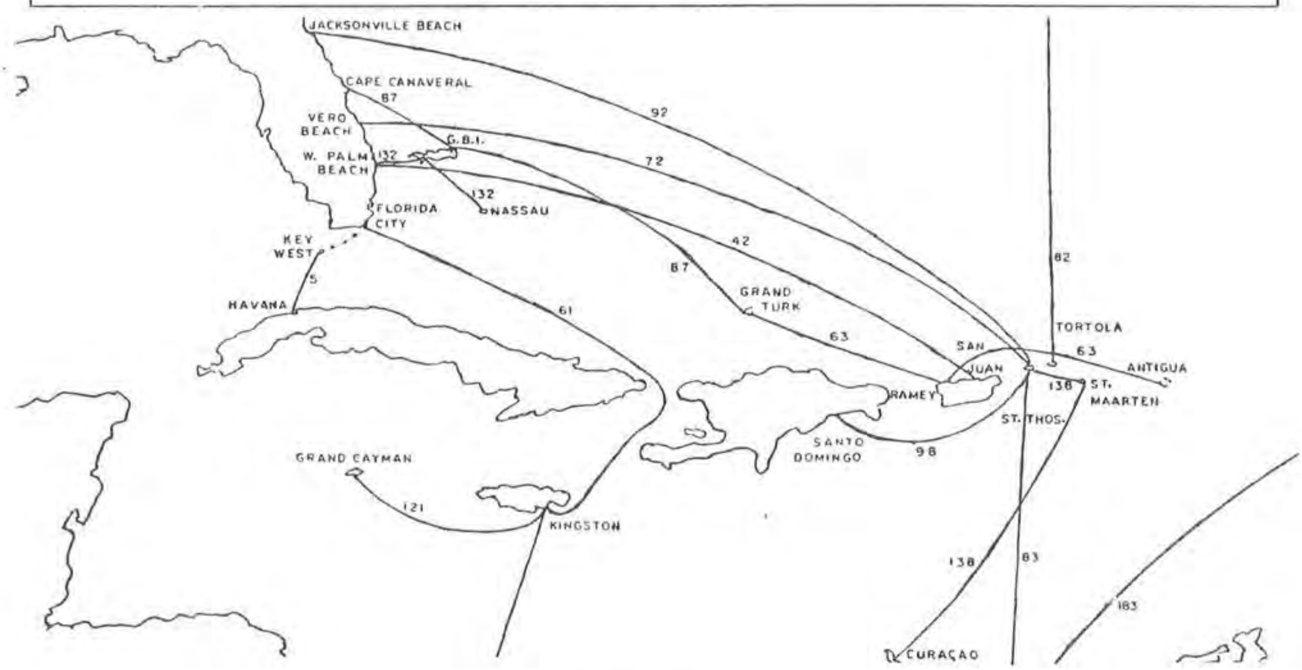
OFFICIAL NAME	Cape Canaveral-Grand Turk	ACRONYM	AFETR
OTHER NAMES	A. F. Eastern Test Range No. 2		

COUNTRY A	U.S.A.	COUNTRY B	Bahama Islands
TERMINUS A	U.S.A.F. Eastern Test Range	TERMINUS B	U.S.A.F. Facility, G.B.I.
LANDING POINT A	Cape Canaveral (Complex 19)	LANDING POINT B	U.S.A.F.F., G.B.I.
COORDINATES A	$28^{\circ}29'$N x $80^{\circ}35'$W	COORDINATES B	$26^{\circ}37'$N x $78^{\circ}19'$W

COUNTRY C	Turks / Caicos Islands	COUNTRY D	
TERMINUS C	U.S.A.F. Facility, Grand Turk	TERMINUS D	
LANDING POINT C	U.S.A.F.F, Grand Turk	LANDING POINT D	
COORDINATES C	$21^{\circ}26'$N x $71^{\circ}07'$W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 203	B C 560					
DATE IN SERVICE	1967	NATURE OF SERVICE	military	SINGLE OR TWIN	single	SYSTEM TYPE	AB: 3M BC: N Mk VII
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



OWNER	United States Government
CIRCUITS HELD	all
I R U HOLDERS	none
CIRCUITS HELD	
LESSEES	none
CIRCUITS LEASED	

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING AB:10nm BC:30nm
NUMBER OF REPEATERS	A B 21 B C 19
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	A B none B C none
EQUALIZATION METHOD	
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	A B double end BC double end
NOMINAL VOLTAGE	600/600 1000/1000 — SYSTEM CURRENT AB:0.502 A BC:0.415 A
NOMINAL TRANSMISSION BANDWIDTH	AB:1116+1116 kHz BD: 240+ 240 kHz — TRANSMISSION FREQUENCIES 312-1428+1848-2964 kHz 60-300+312-552 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AB:270 BC 60 now 270 60 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	The system as originally built had a station at San Salvador. In 1970 this station was closed, the cable was withdrawn, and joined in the sea with the addition of 1 repeater.

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited	CABLESHIP USED:	JOHN W MACKAY

COST	$ MILLION
CABLE	4.3
SUBMERGED ELECTRONICS	1.8
TERMINAL AND POWER FEED	0.7
TERMINAL STATIONS	0.6
INSTALLATION	0.6
TOTAL	8.0
SYSTEM DESIGN LIFE	20 years

OUT OF SERVICE 1975

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **88**

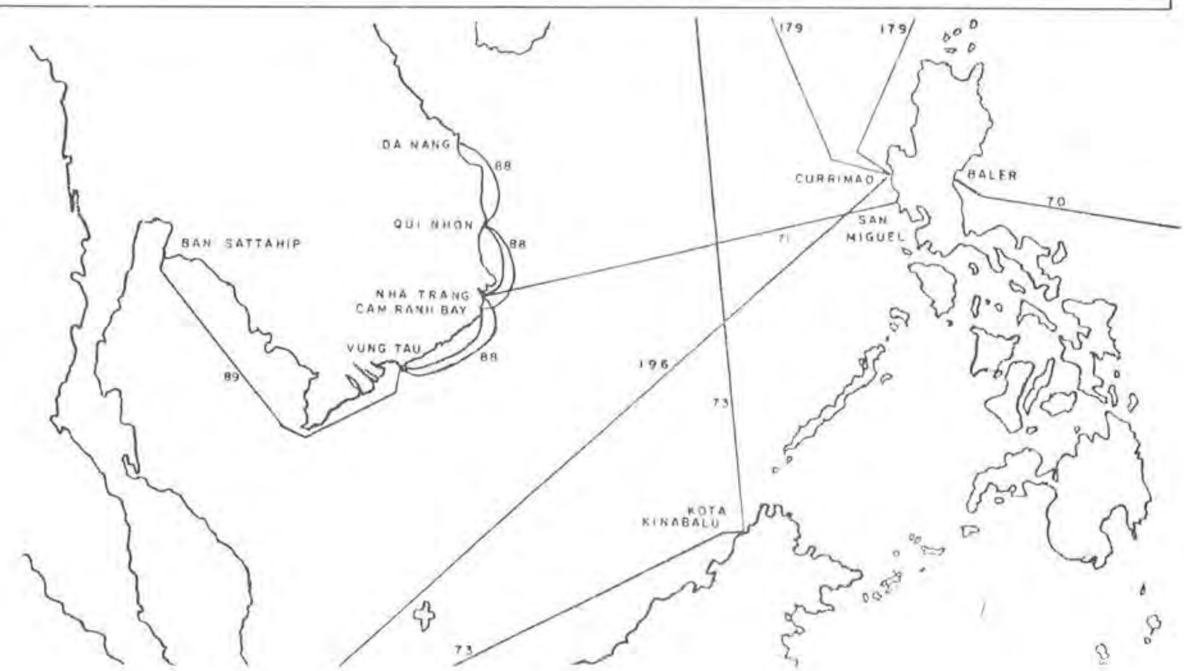
OFFICIAL NAME	Viet Nam Coastal System
OTHER NAMES	Project 439-L

COUNTRY A	Viet Nam	COUNTRY B	Viet Nam
TERMINUS A	Da Nang	TERMINUS B	Qui Nhon
LANDING POINT A	Da Nang	LANDING POINT B	Qui Nhon
COORDINATES A	$16^{\circ}02'N \times 108^{\circ}16'E$	COORDINATES B	$13^{\circ}44'N \times 109^{\circ}13'E$

COUNTRY C	Viet Nam	COUNTRY D	Viet Nam
TERMINUS C	Nha Trang	TERMINUS D	Cam Ranh Bay
LANDING POINT C	Nha Trang	LANDING POINT D	Cam Ranh Bay
COORDINATES C	$12^{\circ}14'N \times 109^{\circ}12'E$	COORDINATES D	$11^{\circ}54'N \times 109^{\circ}16'E$

COUNTRY E	Viet Nam	COUNTRY F	
TERMINUS E	Vung Tau	TERMINUS F	
LANDING POINT E	Vung Tau	LANDING POINT F	
COORDINATES E	$10^{\circ}20'N \times 107^{\circ}06'E$	COORDINATES F	

CABLE MILES	AB 202	BC 122		BD 141	CE 290		DE 206
DATE IN SERVICE	1967	NATURE OF SERVICE	military	SINGLE OR TWIN	single	SYSTEM TYPE	Z60S
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Simplex Wire & Cable Company						



OUT OF SERVICE 1975

88

continued

OWNER	United States Government
CIRCUITS HELD	all
I R U HOLDERS	none
CIRCUITS HELD	
LESSEES	none
CIRCUITS LEASED	

REPEATER DESCRIPTION	monocontainer flexible bidirectional									REPEATER SPACING	17 nm
NUMBER OF REPEATERS	A B	12	B C	7	BD	8	CE	17	DE	12	
REPEATER MANUFACTURER	United States Underseas Cable Corporation										
NUMBER OF EQUALIZERS	A B	none	B C	none	BD	none	CE	1	DE	none	
EQUALIZATION METHOD	computed and assembled on board										
TERMINAL EQUIPMENT MANUFACTURER	Felten & Guilleaume Fernmeldeanlagen GmbH										
POWER FEED MODE	A B	single end	B C	single end	BD	single end	CE	single end	DE	single end	
NOMINAL VOLTAGE		1700		1200		1300		2200		1700	SYSTEM CURRENT 0.426 A
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz					TRANSMISSION FREQUENCIES	24-264+312-552 kHz				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60					CHANNEL SPACING, INITIAL	4 kHz				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		
REMARKS	CABLESHIPS USED: NEPTUN (3), OMEGA										

CONSTRUCTION CONTRACTOR	United States Underseas Cable Corporation

COST	$ MILLION
CABLE	3.8
SUBMERGED ELECTRONICS	2.5
TERMINAL AND POWER FEED	2.5
TERMINAL STATIONS	2.0
INSTALLATION	2.0
TOTAL	12.8
SYSTEM DESIGN LIFE	20 years

OUT OF SERVICE 1975

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **89**

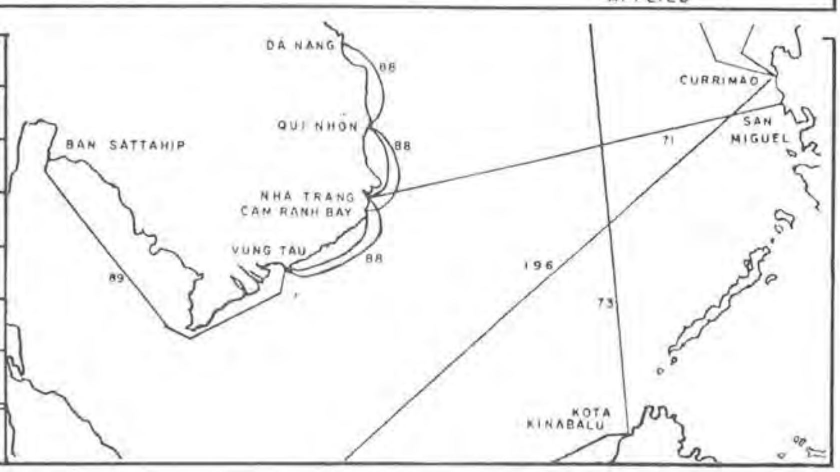
OFFICIAL NAME	Viet Nam-Thailand		
OTHER NAMES	439-L Link G		
COUNTRY A	Viet Nam	COUNTRY B	Thailand
TERMINUS A	Vung Tau	TERMINUS B	Ban Sattahip
LANDING POINT A	Vung Tau	LANDING POINT B	Ban Sattahip
COORDINATES A	$10^{o}20'$ N x $107^{o}51$ E	COORDINATES B	$12^{o}20'$ N x $100^{o}54'$ E

OWNER (when built) U.S. Government — CIRCUITS HELD all

The VietNam end of this system was abandoned in 1975. In 1980 the U.S. Government Surplus Property Office offered the remaining portion of the system for sale by international tender. The system was acquired by a private group of investors.

DATE IN SERVICE	1967
NATURE OF SERVICE	military
CABLE MILES	607
SINGLE OR TWIN	single
SYSTEM TYPE	Z60S
CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Simplex Wire & Cable Company
CABLESHIPS USED:	NEPTUN(3), OMEGA
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	37
REPEATER SPACING	17 nm
REPEATER MANUFACTURER	U.S. Underseas Cable Corporation
CONSTRUCTION CONTRACTOR	U.S. Underseas
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz
TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NUMBER OF EQUALIZERS	3
EQUALIZATION METHOD	compute and assemble on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Felten & Guilleaume Fernmeldeanlagen GmbH
POWER FEED MODE	double end
NOMINAL VOLTAGE	2100/2100
SYSTEM CURRENT	0.426 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	2.5
SUBMERGED ELECTRONICS	1.6
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	0.5
INSTALLATION	0.5
TOTAL	5.9
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

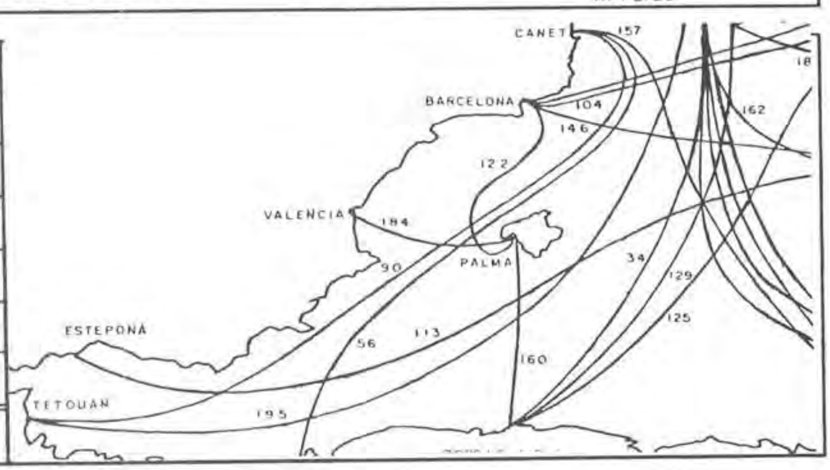
SYSTEM REFERENCE NUMBER **90**

OFFICIAL NAME	Canet Plage- Tetouan		
OTHER NAMES	Perpignan- Tetouan; France-Morocco I		
COUNTRY A	France	COUNTRY B	Morocco
TERMINUS A	Canet Plage	TERMINUS B	Tetouan
LANDING POINT A	Canet Plage	LANDING POINT B	Martil
COORDINATES A	$42^{o}42'$ N x $3^{o}03'$E	COORDINATES B	$35^{o}38'$ N x $5^{o}17'$ W

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	
OWNER B	Administration of PTT	CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1967	NATURE OF SERVICE	commercial	CABLE MILES	758	SINGLE OR TWIN	single	SYSTEM TYPE	S D
CABLE DESCRIPTION	unarmored polyethylene coaxial							CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon			CABLESHIP USED:	MARCEL BAYARD				
REPEATER DESCRIPTION	monocontainer flexible bidirectional					NUMBER OF REPEATERS	39	REPEATER SPACING	18.85 nm
REPEATER MANUFACTURER	Cie. Industrielle de Telecommunications								
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz			TRANSMISSION FREQUENCIES	108-554+660-1052 kHz				
NUMBER OF EQUALIZERS	3			EQUALIZATION METHOD					
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	96	now 96		CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz			
TERMINAL EQUIPMENT MANUFACTURER	CIT							CONSTRUCTION CONTRACTOR	CIT
POWER FEED MODE	double end	NOMINAL VOLTAGE	2200/2200	SYSTEM CURRENT	0.325				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	4.91
SUBMERGED ELECTRONICS	2.92
TERMINAL AND POWER FEED	0.46
TERMINAL STATIONS	0.44
INSTALLATION	0.22
TOTAL	8.95
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **91**

OFFICIAL NAME	Gairloch-Stornoway		
OTHER NAMES	Loch Gairloch-Loch Erisort		
COUNTRY A	United Kingdom, (Scotland)	COUNTRY B	United Kingdom
TERMINUS A	Gairloch, County Ross & Comarty	TERMINUS B	Stornoway, Isle of Lewis
LANDING POINT A	Gairloch	LANDING POINT B	Stornoway
COORDINATES A	57°43' N x 5°42' W	COORDINATES B	58° 8' N x 6°24' W

OWNER	British Government	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1967	NATURE OF SERVICE	governmental	CABLE MILES	48	SINGLE OR TWIN	single	SYSTEM TYPE	D

CABLE DESCRIPTION: armored polyethylene coaxial — CABLE SIZE: 0.62" 15.7 mm

CABLE MANUFACTURER: Submarine Cables Limited

REPEATER DESCRIPTION: monocontainer inflexible bidirectional — NUMBER OF REPEATERS: 1 — REPEATER SPACING: -

REPEATER MANUFACTURER: Submarine Cables Limited

NOMINAL TRANSMISSION BANDWIDTH: 240+240 kHz — TRANSMISSION FREQUENCIES: 60-300+360-608 kHz

NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -

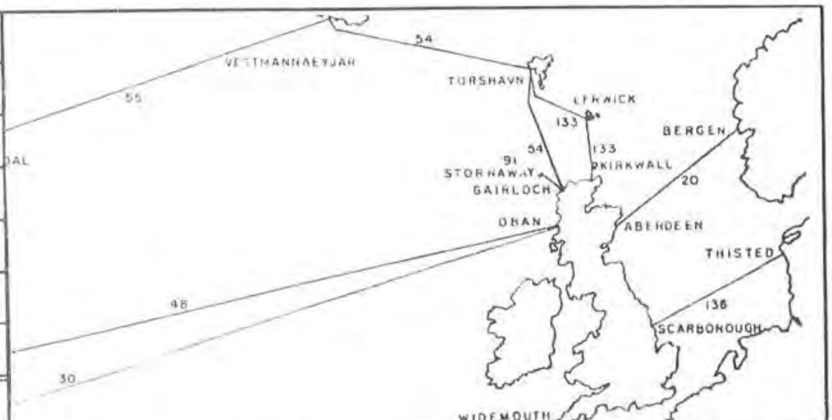
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 60 — now 60 — CHANNEL SPACING, INITIAL: 4 kHz — now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: General Electric Co. (England) — CONSTRUCTION CONTRACTOR: BPO

POWER FEED MODE: single end — NOMINAL VOLTAGE: 350 — SYSTEM CURRENT: 0.350 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	0.120
SUBMERGED ELECTRONICS	0.013
TERMINAL AND POWER FEED	0.013
TERMINAL STATIONS	0.024
INSTALLATION	0.020
TOTAL	0.190
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

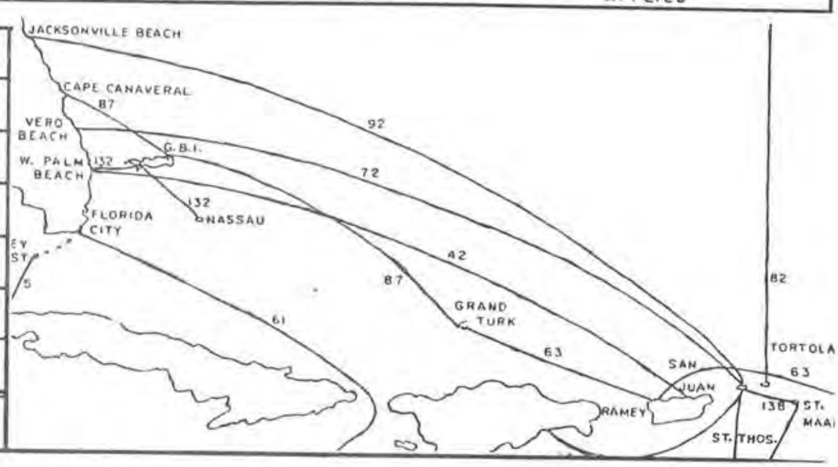
SYSTEM REFERENCE NUMBER **92**

OFFICIAL NAME	Florida-St. Thomas No. 2	ACRONYM	ST T 2
OTHER NAMES	Jacksonville Beach-Magens Bay		
COUNTRY A	U.S.A.	COUNTRY B	U.S.A. (Virgin Islands)
TERMINUS A	Jacksonville Beach, Florida	TERMINUS B	Magens Bay, St. Thomas
LANDING POINT A	Jacksonville Beach	LANDING POINT B	Magens Bay
COORDINATES A	30°18' N x 81°24' W	COORDINATES B	18°22' N x 64°56' W

OWNER A *	
OWNER B *	
I R U HOLDERS *	
CIRCUITS HELD *	
	* see following page

DATE IN SERVICE	1968	NATURE OF SERVICE	commercial
CABLE MILES	1298	SINGLE OR TWIN	single
SYSTEM TYPE	SF		
CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	LONG LINES
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized	NUMBER OF REPEATERS	140
REPEATER SPACING	10 nm		
REPEATER MANUFACTURER	Western Electric Company		
NOMINAL TRANSMISSION BANDWIDTH	2160+2160 kHz	TRANSMISSION FREQUENCIES	554-2920+3575-5894 kHz
NUMBER OF EQUALIZERS	6	EQUALIZATION METHOD	switched networks
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	720	now	720
CHANNEL SPACING, INITIAL	3 kHz	now	3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	1050/1050
SYSTEM CURRENT	0.136 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST	$ MILLION
CABLE	16.67
SUBMERGED ELECTRONICS	9.79
TERMINAL AND POWER FEED	3.97
TERMINAL STATIONS	1.36
INSTALLATION	1.01
TOTAL	32.8
SYSTEM DESIGN LIFE	24 years



FLORIDA - ST. THOMAS No. 2

Allocation			Circuits
American Telephone & Telegraph Co.			4
"	Compañía Dominicana de Teléfonos C por A	*	88
"	Compañía Anónima Nacional de Teléfonos de Venezuela	*	13
"	ITT Communications, Inc., Virgin Islands		517
"	Netherlands Antilles Government	*	33
"	Cable & Wireless Limited	*	38
"	French Ministry of Posts and Telegraphs	*	8
"	Guyana Telecom. Corp.		3
"	Telco d'Haiti		15
Canadian Overseas Telecommunications Corp. * +			9
Compania Telefónica Nacional de España *	ITT Communications, Inc., Virgin Islands		4
" *	Compañía Anonima Nacional de Teléfonos de Venezuela	*	2
Compañia Dominicana de Teléfonos, C por A *			4
ITT Communications, Inc. V. I.			5
ITT World Communications, Inc.			40
RCA Global Communications, Inc.			28
Western Union International, Inc.			30
TRT Telecommunications Corp. *			4
		TOTAL CIRCUITS	845

*IRU + now Teleglobe Canada

SEACABLE SYSTEM DATA PROFILE

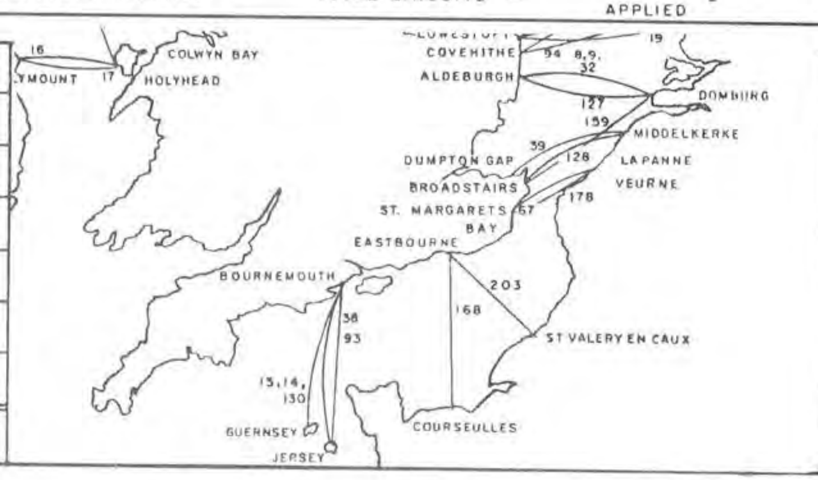
SYSTEM REFERENCE NUMBER **93**

OFFICIAL NAME	St. Helier-Tuckton Bridge B		
OTHER NAMES	St. Helier-Tuckton Bridge No. 2 Hengistbury Head-St. Helier No. 2		
COUNTRY A	England	COUNTRY B	Jersey
TERMINUS A	Tuckton Bridge	TERMINUS B	St. Helier
LANDING POINT A	Hengistbury Head	LANDING POINT B	St. Helier
COORDINATES A	50°42' N x 1°48' W	COORDINATES B	49°08' N x 2°5' W

OWNER	British Post Office	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1968	NATURE OF SERVICE	commercial	CABLE MILES	137	SINGLE OR TWIN	single	SYSTEM TYPE	T Mk I
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.935" 23.7 mm		
CABLE MANUFACTURER	Submarine Cables Limited			CABLESHIPS USED:	MONARCH (4), POOLSTER (2)				
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized			NUMBER OF REPEATERS	18	REPEATER SPACING	7.5 nm		
REPEATER MANUFACTURER	Submarine Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz						
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz				
TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries		CONSTRUCTION CONTRACTOR	SCL					
POWER FEED MODE	double end	NOMINAL VOLTAGE	225/225	SYSTEM CURRENT	0.150 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.3
SUBMERGED ELECTRONICS	1.0
TERMINAL AND POWER FEED	0.7
TERMINAL STATIONS	0.45
INSTALLATION	0.25
TOTAL	3.70
SYSTEM DESIGN LIFE	20 years



RETIRED 1983

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **94**

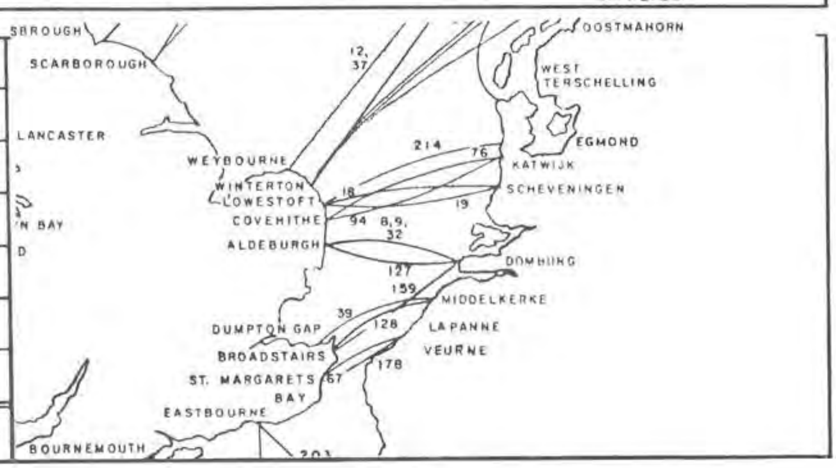
OFFICIAL NAME	Covehithe-Katwijk No. 2		
OTHER NAMES	Covehithe-Katwijk B		
COUNTRY A	Netherlands	COUNTRY B	England
TERMINUS A	Oegstgeest, South Holland	TERMINUS B	Covehithe, Suffolk
LANDING POINT A	Katwijk	LANDING POINT B	Covehithe
COORDINATES A	$52^{\circ}12'$ N x $4^{\circ}24'$ E	COORDINATES B	$52^{\circ}22'$ N x $01^{\circ}42'$ E

OWNER A	Administration of PTT	CIRCUITS HELD	
OWNER B	British Post Office	CIRCUITS HELD	
I R U HOLDERS	Deutsche Bundespost		
CIRCUITS HELD	60		
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1968	NATURE OF SERVICE	commercial	CABLE MILES	109	SINGLE OR TWIN	single	SYSTEM TYPE	T Mk I

CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Submarine Cables Limited
CABLESHIP USED:	MONARCH (4)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized
NUMBER OF REPEATERS	14
REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Submarine Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz
TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480 now 480
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries
CONSTRUCTION CONTRACTOR	SCL
POWER FEED MODE	double end
NOMINAL VOLTAGE	175/175
SYSTEM CURRENT	0.150 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.45
SUBMERGED ELECTRONICS	0.50
TERMINAL AND POWER FEED	0.45
TERMINAL STATIONS	-
INSTALLATION	0.10
TOTAL	1.50
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

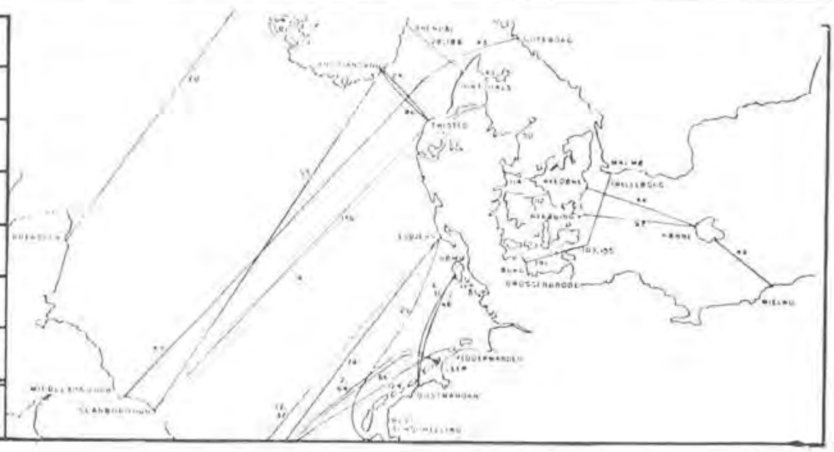
SYSTEM REFERENCE NUMBER **95**

OFFICIAL NAME	Kristiansand-Scarborough		
OTHER NAMES	Kristiansand-Scarborough A	Kristiansand-Cayton Bay	
COUNTRY A	Norway	COUNTRY B	England
TERMINUS A	Kristiansand	TERMINUS B	Scarborough, Yorkshire
LANDING POINT A	Kristiansand	LANDING POINT B	Cayton Bay
COORDINATES A	58°10'N x 08°01' E	COORDINATES B	54°15' N x 0°22' W

OWNER A	Administration of Telecommunications	CIRCUITS HELD	480h
OWNER B	British Post Office	CIRCUITS HELD	480h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1968	NATURE OF SERVICE	commercial	CABLE MILES	393	SINGLE OR TWIN	single	SYSTEM TYPE	T&X Mk I
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Submarine Cables Limited			CABLESHIP USED:	MONARCH (4)				
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized					NUMBER OF REPEATERS	53	REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Submarine Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz			TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz				
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480		CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz			
TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries			CONSTRUCTION CONTRACTOR	SCL				
POWER FEED MODE	double end	NOMINAL VOLTAGE	690/690	SYSTEM CURRENT	0.150 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.50
SUBMERGED ELECTRONICS	1.75
TERMINAL AND POWER FEED	0.35
TERMINAL STATIONS	0.20
INSTALLATION	0.10
TOTAL	3.90
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

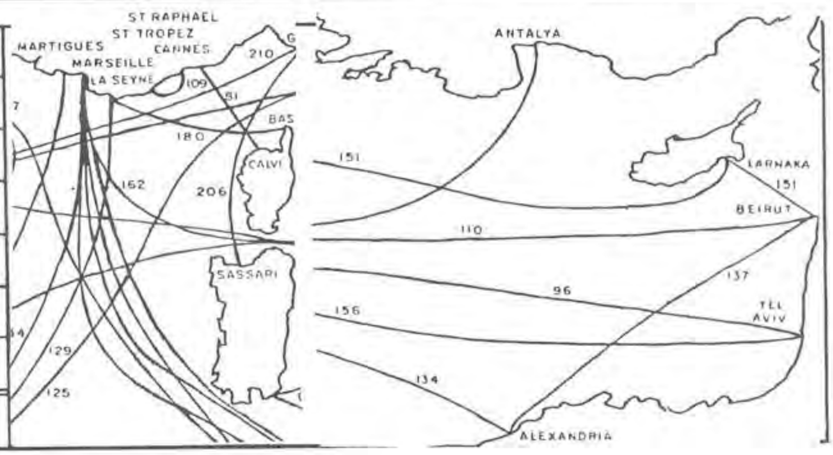
SYSTEM REFERENCE NUMBER **96**

OFFICIAL NAME	Marseille-Tel Aviv	ACRONYM	MARTEL
OTHER NAMES	France-Israel		
COUNTRY A	France	COUNTRY B	Israel
TERMINUS A	Marseille	TERMINUS B	Tel Aviv
LANDING POINT A	Marseille	LANDING POINT B	Tel Aviv
COORDINATES A	43°16' N x 5°23' E	COORDINATES B	32°4' N x 34°46' E

OWNER	The International Telecommunications Company Ltd.,								CIRCUITS HELD	256 h
EXCOFINA, a joint enterprise of France Câble et Radio and the government of Israel										
I R U HOLDERS	ATT	France	BPO	DBP	CH	Italy	Belgium	NL	Israel	
CIRCUITS HELD	32 h	32 h	21 h	16 h	12 h	8 h	2 1/2 h	2 1/2 h	130h	
LESSEES										
CIRCUITS LEASED										

DATE IN SERVICE	1968
NATURE OF SERVICE	commercial
CABLE MILES	1833
SINGLE OR TWIN	single
SYSTEM TYPE	SD
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon Alsacienne
CABLESHIP USED:	MARCEL BAYARD
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	96
REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz
TRANSMISSION FREQUENCIES	108-554+660-1052 kHz
NUMBER OF EQUALIZERS	9
EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	96 now 128
CHANNEL SPACING, INITIAL	4 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Cie. Industrielle de Télécommunicat.
CONSTRUCTION CONTRACTOR	EXCOFINA
POWER FEED MODE	double end
NOMINAL VOLTAGE	3500/3500
SYSTEM CURRENT	0.325 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	10
SUBMERGED ELECTRONICS	7
TERMINAL AND POWER FEED	1
TERMINAL STATIONS	1
INSTALLATION	1
TOTAL	20
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **97**

OFFICIAL NAME	Nykøbing-Rønne		
OTHER NAMES			
COUNTRY A	Denmark (Is. of Bornholm)	COUNTRY B	Denmark
TERMINUS A	Rønne	TERMINUS B	Nykøbing, Falster
LANDING POINT A	Hvideodde	LANDING POINT B	Korselitze
COORDINATES A	55°7' N x 14°39' E	COORDINATES B	54°45' N x 12°02' E

OWNER	Administration of Posts and Telegraphs	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE 1968 | NATURE OF SERVICE commercial | CABLE MILES 103 | SINGLE OR TWIN single | SYSTEM TYPE T Mk I

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.950" 24.1 mm

CABLE MANUFACTURER Submarine Cables Limited | CABLESHIPS USED: ALERT (4), PETER FABER (2)

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized | NUMBER OF REPEATERS 13 | REPEATER SPACING 7.5 nm

REPEATER MANUFACTURER Submarine Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD –

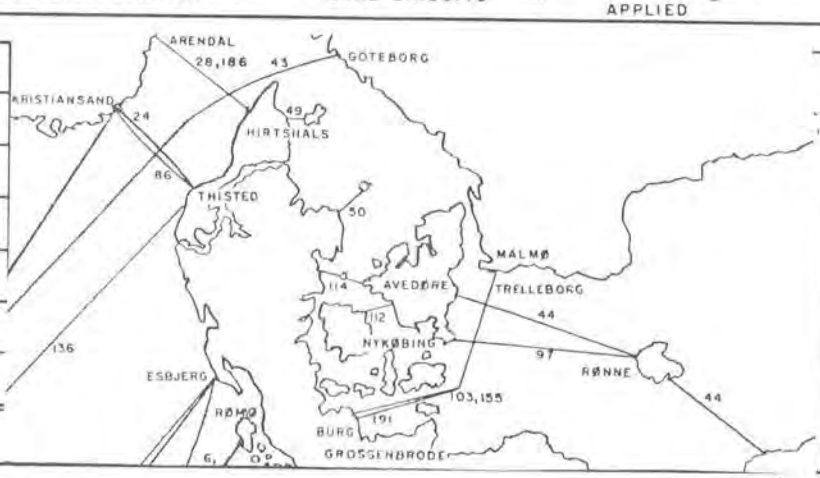
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Associated Electrical Industries | CONSTRUCTION CONTRACTOR SCL

POWER FEED MODE double end | NOMINAL VOLTAGE 140/140 | SYSTEM CURRENT 0.150 A

TASI TYPE – | CIRCUITS USED – | CIRCUITS DERIVED – | TOTAL CIRCUITS – | DATE APPLIED –

COST	$ MILLION
CABLE	0.58
SUBMERGED ELECTRONICS	0.63
TERMINAL AND POWER FEED	0.37
TERMINAL STATIONS	0.23
INSTALLATION	0.12
TOTAL	1.93
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **98**

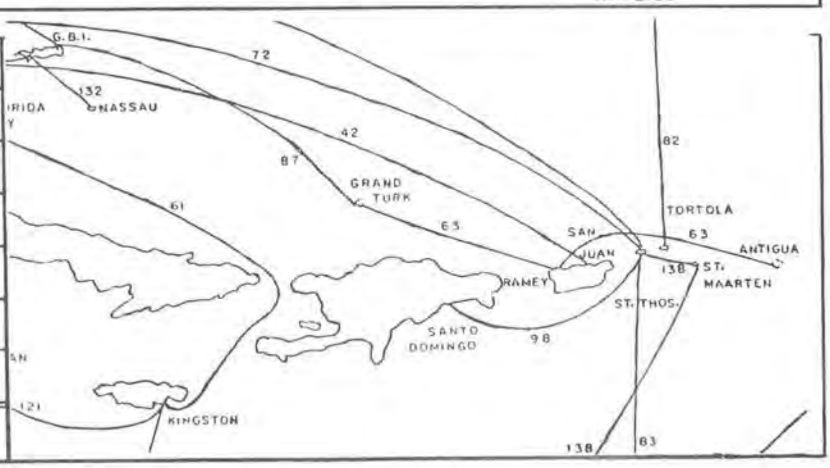
OFFICIAL NAME	St. Thomas-Dominican Republic		
OTHER NAMES	Magens Bay-Sto. Domingo		
COUNTRY A	U.S.A. (Virgin Islands)	COUNTRY B	Dominican Republic
TERMINUS A	Magens Bay, St. Thomas	TERMINUS B	Sto. Domingo
LANDING POINT A	Magens Bay	LANDING POINT B	Sto. Domingo
COORDINATES A	$18^{o}22'$ N x $64^{o}56$ W	COORDINATES B	$18^{o}26'$ N x $69^{o}56'$ W

OWNER A	American Telephone & Telegraph Company					CIRCUITS HELD 4+ 97h
OWNER B	Compañia Dominicana de Teléfonos, C. por A.					CIRCUITS HELD 4+ 97h
I R U HOLDERS	CDT with ITTWC,	ITTCVI,	RCAGC,	CANTV,	NAG,	WUI
CIRCUITS HELD	4	12	1	4	2	1
	ATT with Telco d'Haiti					
	15					

DATE IN SERVICE	1968	NATURE OF SERVICE	commercial	CABLE MILES	386	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Western Electric Company
CABLESHIPS USED:	LONG LINES STANLEY ANGWIN
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	20
REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Western Electric Company
NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz
TRANSMISSION FREQUENCIES	108-504+660-1052 kHz
NUMBER OF EQUALIZERS	1
EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	144 now 144
CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company
CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	single end
NOMINAL VOLTAGE	1100
SYSTEM CURRENT	0.370 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	4.4
SUBMERGED ELECTRONICS	0.8
TERMINAL AND POWER FEED	1.8
TERMINAL STATIONS	0.4
INSTALLATION	0.5
TOTAL	7.9
SYSTEM DESIGN LIFE	24 years



RETIRED 1979

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **99**

OFFICIAL NAME	Catanzaro-Lekhainá		
OTHER NAMES	Italy-Greece MED 3		
COUNTRY A	Italy	COUNTRY B	Greece
TERMINUS A	Catanzaro	TERMINUS B	Lekhainá
LANDING POINT A	Marina di Catanzaro	LANDING POINT B	Lekhainá
COORDINATES A	38°54' N x 16°38' E	COORDINATES B	37°58' N x 21°13' E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	480 h
OWNER B	Hellenic Telecommunications Organization OTE	CIRCUITS HELD	480 h

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	286	SINGLE OR TWIN	single	SYSTEM TYPE	Y

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Submarine Cables Limited	CABLESHIP USED:	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	28	REPEATER SPACING	10 nm

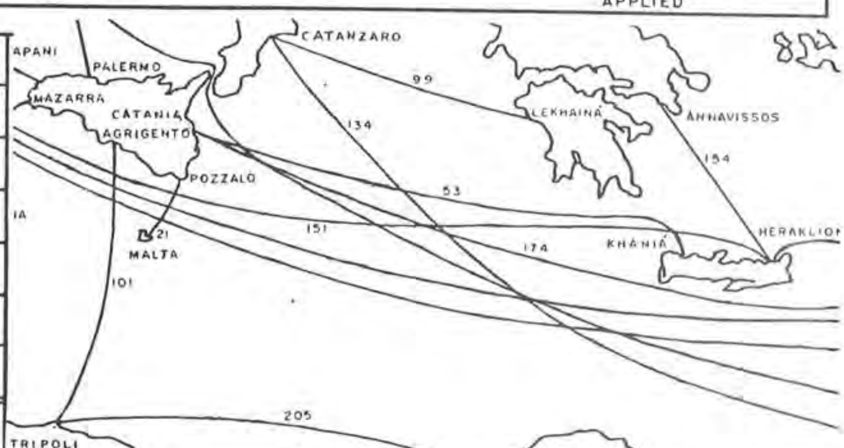
REPEATER MANUFACTURER	Submarine Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	General Electric Company (England)	CONSTRUCTION CONTRACTOR	SCL

POWER FEED MODE	double end	NOMINAL VOLTAGE	400/400	SYSTEM CURRENT	0.150 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	2.2
SUBMERGED ELECTRONICS	1.5
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.4
INSTALLATION	0.3
TOTAL	4.8
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **100**

OFFICIAL NAME	Italy-Sardinia 2		
OTHER NAMES	Civitavecchia-Golfo Aranci 2		
COUNTRY A	Italy (mainland)	COUNTRY B	Italy (Sardinia)
TERMINUS A	Civitavecchia	TERMINUS B	Olbia
LANDING POINT A	Civitavecchia	LANDING POINT B	Golfo Aranci
COORDINATES A	$42^{o}6'$ N x $11^{o}48'$ E	COORDINATES B	$41^{o}0'$ N x $9^{o}38'$ E

OWNER	Ministero delle Poste e delle Telecommunicazione	CIRCUITS HELD	all
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	135	SINGLE OR TWIN	single	SYSTEM TYPE	Y

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	SALERNUM

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	20	REPEATER SPACING	7 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 1 EQUALIZATION METHOD adjusted on board

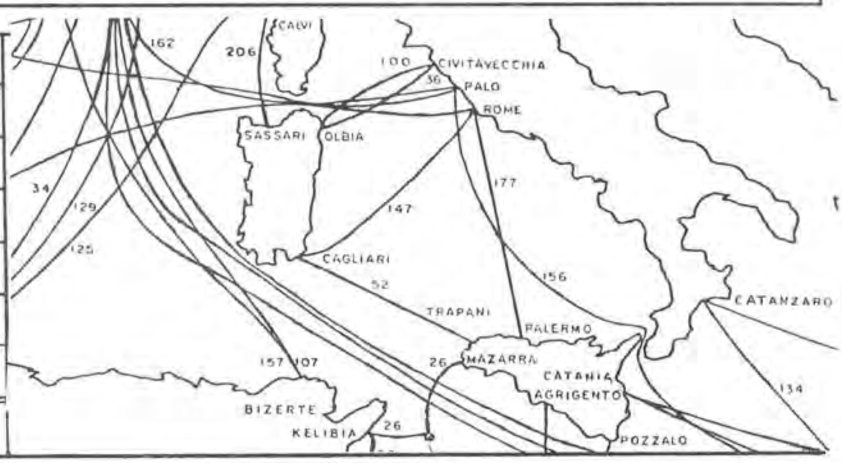
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end NOMINAL VOLTAGE 400/400 SYSTEM CURRENT 0.150 A

TASI TYPE – CIRCUITS USED – CIRCUITS DERIVED – TOTAL CIRCUITS – DATE APPLIED –

COST	$ MILLION
CABLE	0.72
SUBMERGED ELECTRONICS	0.93
TERMINAL AND POWER FEED	0.40
TERMINAL STATIONS	0.40
INSTALLATION	0.50
TOTAL	2.95
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **101**

OFFICIAL NAME	Agrigento-Tripoli		
OTHER NAMES	Siciliy-Libya		
COUNTRY A	Italy	COUNTRY B	Libya
TERMINUS A	Agrigento, Sicily	TERMINUS B	Tripoli
LANDING POINT A	Agrigento	LANDING POINT B	Tripoli
COORDINATES A	$37^{o}19'$ N x $13^{o}20'$ E	COORDINATES B	$32^{o}58'$ N x $13^{o}13'$ E

OWNER A	Ministero delle Poste e delle Telecomunicazione	CIRCUITS HELD	120 h
OWNER B	Ministry of Communications	CIRCUITS HELD	120 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	298	SINGLE OR TWIN	single	SYSTEM TYPE	U Mk I

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	JOHN W MACKAY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	24	REPEATER SPACING	17.1 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	adjusted on board

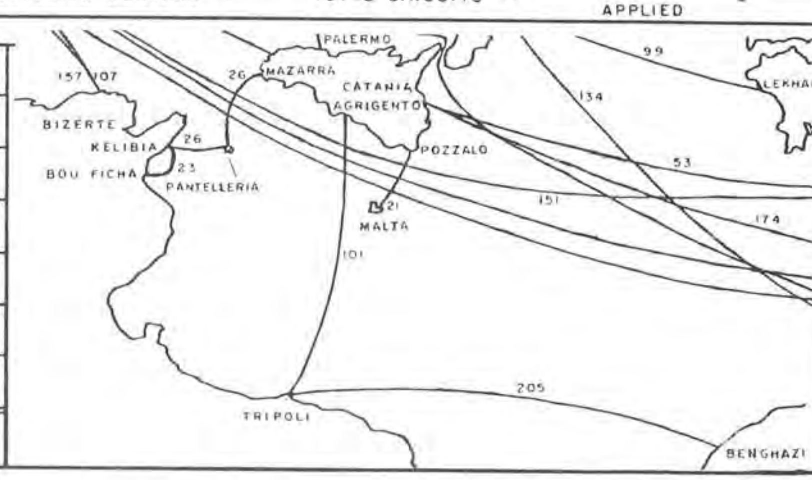
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120	now 120	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	1500/1500	SYSTEM CURRENT	0.415 A

TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST	$ MILLION
CABLE	1.6
SUBMERGED ELECTRONICS	1.2
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.4
INSTALLATION	0.3
TOTAL	3.9
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **102**

OFFICIAL NAME	Japan Sea Cable	ACRONYM	JASC
OTHER NAMES	Nakhodka - Naoetsu		
COUNTRY A	Japan	COUNTRY B	U.S.S.R.
TERMINUS A	Naoetsu, Niigata	TERMINUS B	Nakhodka, Maritime Territory
LANDING POINT A	Naoetsu	LANDING POINT B	Nakhodka
COORDINATES A	37°10'N x 138°14' E	COORDINATES B	42°48' N x 132°49' E

OWNER A	Kokusai Denshin Denwa Company Ltd.	CIRCUITS HELD	120h
OWNER B	The Great Northern Telegraph Co. Ltd. (Denmark)	CIRCUITS HELD	120h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	477	SINGLE OR TWIN	single	SYSTEM TYPE	Z120S

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00'' 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Ltd. (Japan)	CABLESHIP USED:	KDD MARU

REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized	NUMBER OF REPEATERS	28	REPEATER SPACING	17 nm

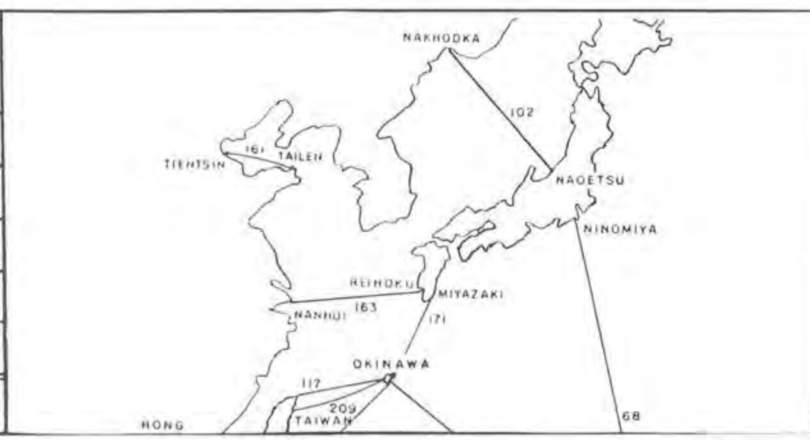
REPEATER MANUFACTURER	United States Underseas Cable Corp.

NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+684-1176 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	120 now 120	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	TEKADF-Felten & Guilleaume Fernmeldeanlagen GmbH	CONSTRUCTION CONTRACTOR	USUCC

POWER FEED MODE	effective double end	NOMINAL VOLTAGE	830	SYSTEM CURRENT	0.054 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-						

COST	$ MILLION
CABLE	2.4
SUBMERGED ELECTRONICS	1.8
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	1.0
INSTALLATION	0.7
TOTAL	6.7
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

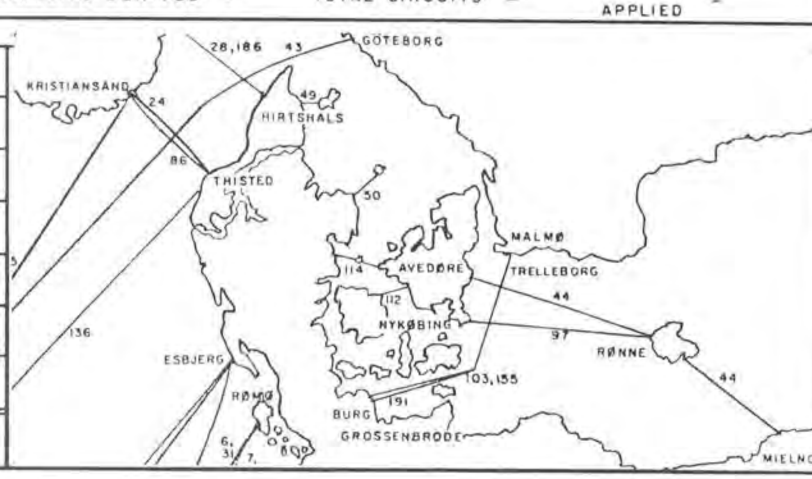
SYSTEM REFERENCE NUMBER **103**

OFFICIAL NAME	Germany - Sweden 1		
OTHER NAMES	G - S 1		
COUNTRY A	Federal Republic of Germany	COUNTRY B	Sweden
TERMINUS A	Burg, Fehmarn	TERMINUS B	Malmö
LANDING POINT A	Presen	LANDING POINT B	Fredshög
COORDINATES A	$54^{o}29'$ N x $11^{o}15'$ E	COORDINATES B	$55^{o}23'$ N x $13^{o}1'$ E

OWNER A	Deutsche Bundespost	CIRCUITS HELD	360h
OWNER B	Televerket	CIRCUITS HELD	240h
I R U HOLDERS	Telegrafstyret, Norway		
CIRCUITS HELD	120h		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	121	SINGLE OR TWIN	single	SYSTEM TYPE	Y
CABLE DESCRIPTION	armored polyethylene coaxial							CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIP USED: JOHN W MACKAY			
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized					NUMBER OF REPEATERS	15	REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480		CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz			
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.			CONSTRUCTION CONTRACTOR	STC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	190/190	SYSTEM CURRENT	0.118 A				
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -		TOTAL CIRCUITS -		DATE APPLIED -			

COST	$ MILLION
CABLE	0.71
SUBMERGED ELECTRONICS	0.74
TERMINAL AND POWER FEED	0.39
TERMINAL STATIONS	0.41
INSTALLATION	0.25
TOTAL	2.50
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **104**

OFFICIAL NAME	Barcelona - Pisa	ACRONYM	BAPI
OTHER NAMES	Spain - Italy 1		
COUNTRY A	Spain	COUNTRY B	Italy
TERMINUS A	Barcelona	TERMINUS B	Pisa
LANDING POINT A	Barceloneta Beach	LANDING POINT B	Marina di Pisa
COORDINATES A	$41^{o}23'$ N x $2^{o}12'$ E	COORDINATES B	$43^{o}38'$ N x $10^{o}17'$ E

OWNER A	Compañía Telefónica Nacional de España		CIRCUITS HELD	480 h
OWNER B	Azienda di Stato per i Servizi Telefonici		CIRCUITS HELD	480 h
I R U HOLDERS	DBP	PTT Portugal	SACC	
CIRCUITS HELD	72	28	8	
LESSEES	Various			
CIRCUITS LEASED	12			

DATE IN SERVICE 1969 — NATURE OF SERVICE commercial — CABLE MILES 430 — SINGLE OR TWIN single — SYSTEM TYPE NC(Y)

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 0.99" 25.1 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited — CABLESHIP USED: JOHN W MACKAY

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized — NUMBER OF REPEATERS 59 — REPEATER SPACING 7.5 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz — TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 4 — EQUALIZATION METHOD adjusted on board

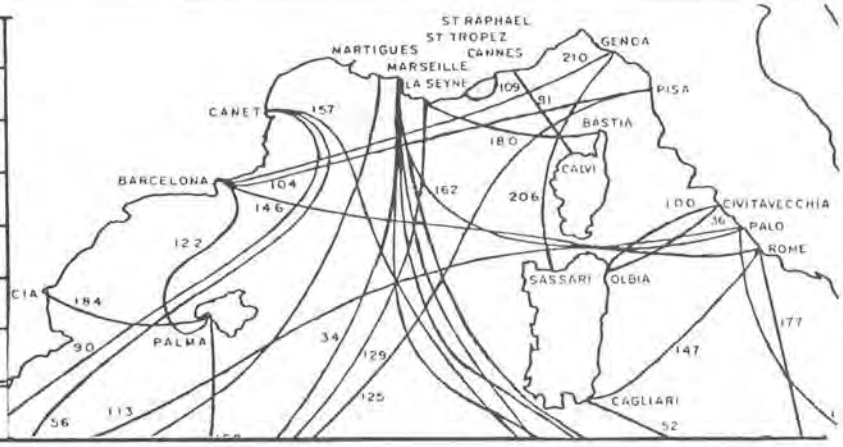
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end — NOMINAL VOLTAGE 800/800 — SYSTEM CURRENT 0.150 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST Estimated	$ MILLION
CABLE	2.3
SUBMERGED ELECTRONICS	3.1
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.4
INSTALLATION	0.5
TOTAL	6.7
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **105**

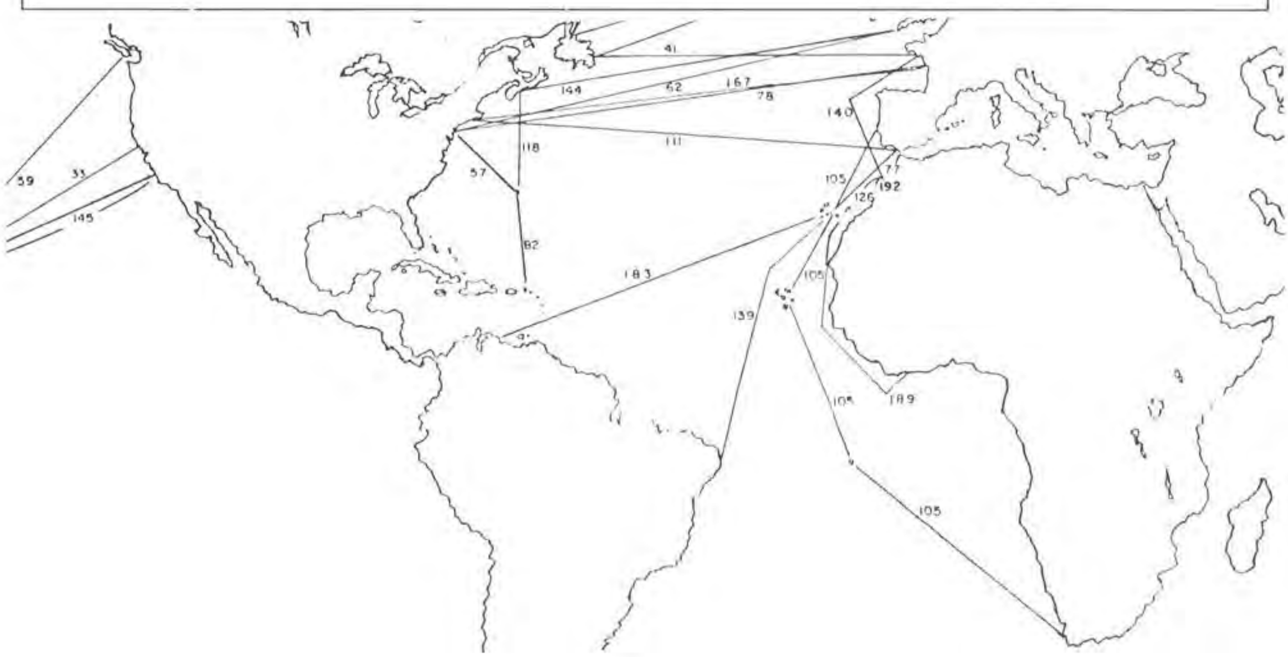
OFFICIAL NAME	South Atlantic No. 1	ACRONYM	SAT I
OTHER NAMES	Portugal-South Africa		

COUNTRY A	Portugal	COUNTRY B	Canary Is. (Spain)
TERMINUS A	Sesimbra	TERMINUS B	Santa Cruz de Tenerife
LANDING POINT A	Sesimbra	LANDING POINT B	Santa Cruz
COORDINATES A	38°26' N x 9°6' W	COORDINATES B	28°27' N x 16°15' W

COUNTRY C	Cape Verde Is.	COUNTRY D	Ascension Is.
TERMINUS C	Baia da Mordeira	TERMINUS D	Georgetown
LANDING POINT C	Baia da Mordeira	LANDING POINT D	Georgetown
COORDINATES C	16°41' N x 22°58' W	COORDINATES D	7°57' S x 14°25' W

COUNTRY E	Republic of South Africa	COUNTRY F	
TERMINUS E	Melkbosstrand	TERMINUS F	
LANDING POINT E	Melkbosstrand	LANDING POINT F	
COORDINATES E	33°43' S x 18°27' E	COORDINATES F	

CABLE MILES	AB 745	BC 862	CD 1702	DE 2594			
DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	3 M
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



OWNERS	South Atlantic Cable Company Pty. Ltd.
CIRCUITS HELD	16 + 334 h

I R U HOLDERS	UKPO	DBP	NL	France	Belgium	Italy	CPRM	CTNE	CH	C&W
CIRCUITS HELD	226 h	40h	10h	8h	5h	19h	6+13h	9h	1h	2 + 5 h
LESSEES										
CIRCUITS LEASED										

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING 9.8 nm
NUMBER OF REPEATERS	A B 79 — B C 92 — C D 179 — D E 277
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	A B 6 — B C 8 — C D 14 — D E 22
EQUALIZATION METHOD	Designed and assembled on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	A B double end — BD double end — D E double end
NOMINAL VOLTAGE	2350/2350 — 8000/8000 — 8000/8000 — SYSTEM CURRENT 0.502 A
NOMINAL TRANSMISSION BANDWIDTH	1116+1116 kHz — TRANSMISSION FREQUENCIES 312-1428+1848-2964 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	360 now 360 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TASI TYPE -	CIRCUITS USED - — CIRCUITS DERIVED - — TOTAL CIRCUITS - — DATE APPLIED -
REMARKS	CABLESHIPS USED: MONARCH (4), MERCURY, JOHN W MACKAY

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited

COST	$ MILLION
CABLE	21.6
SUBMERGED ELECTRONICS	33.5
TERMINAL AND POWER FEED	4.0
TERMINAL STATIONS	1.3
INSTALLATION	13.0
TOTAL	73.4
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **106**

OFFICIAL NAME	Goonhilly-Sesimbra		
OTHER NAMES	U.K. - Portugal		
COUNTRY A	England	COUNTRY B	Portugal
TERMINUS A	Goonhilly Downs, Cornwall	TERMINUS B	Sesimbra
LANDING POINT A	Kennack Sands	LANDING POINT B	Sesimbra
COORDINATES A	$50^{\circ}01'$ N x $05^{\circ}08'$ W	COORDINATES B	$38^{\circ}26'$ N x $9^{\circ}6'$ W

OWNER A	British Post Office
OWNER B	Companhia Portuguesa Rádio Marconi
I R U HOLDERS	see accompanying page
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

DATE IN SERVICE 1969 | NATURE OF SERVICE commercial | CABLE MILES 951 | SINGLE OR TWIN single | SYSTEM TYPE Y

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 0.99" 25.1 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited | CABLESHIP USED: ALERT (4)

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized | NUMBER OF REPEATERS 128 | REPEATER SPACING 7.6 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 10 | EQUALIZATION METHOD adjusted on board

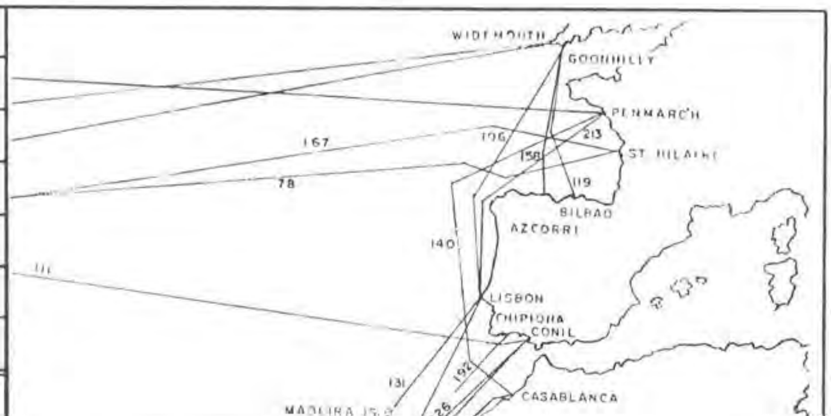
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 640 | CHANNEL SPACING, INITIAL 4 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. | CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end | NOMINAL VOLTAGE 1750/1750 | SYSTEM CURRENT 0.150 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	5.0
SUBMERGED ELECTRONICS	6.5
TERMINAL AND POWER FEED	3.3
TERMINAL STATIONS	0.1
INSTALLATION	0.4
TOTAL	15.3
SYSTEM DESIGN LIFE	20 years



ALLOCATIONS

	ATT	ITTWC
BPO		10
Ireland	8	1
Denmark	7	
Finland	2	1
DBP	36	3
Norway	7	
Netherlands	9	3
Belgium	9	7
Sweden	15	1
U. S. S. R.		1

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **107**

OFFICIAL NAME	Marseille-Bizerte		
OTHER NAMES	France - Tunisia 1		
COUNTRY A	France	COUNTRY B	Tunisia
TERMINUS A	Marseille	TERMINUS B	Bizerte
LANDING POINT A	Marseille	LANDING POINT B	Bizerte
COORDINATES A	$43^{o}16'$ N x $5^{o}23'$ E	COORDINATES B	$37^{o}26'$ N x $9^{o}49'$ E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	93h
OWNER B	Administration of PTT	CIRCUITS HELD	96h
I R U HOLDERS	ATT		
CIRCUITS HELD	3		
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1969	NATURE OF SERVICE	commercial	CABLE MILES	462	SINGLE OR TWIN	single	SYSTEM TYPE	SD

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon Alsacienne	CABLESHIP USED:	MARCEL BAYARD

REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	24	REPEATER SPACING	20 nm

REPEATER MANUFACTURER	Compagnie Industrielle de Télécomunications

NOMINAL TRANSMISSION BANDWIDTH	384+384 kHz	TRANSMISSION FREQUENCIES	108-554+660-1052 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	stepping switch

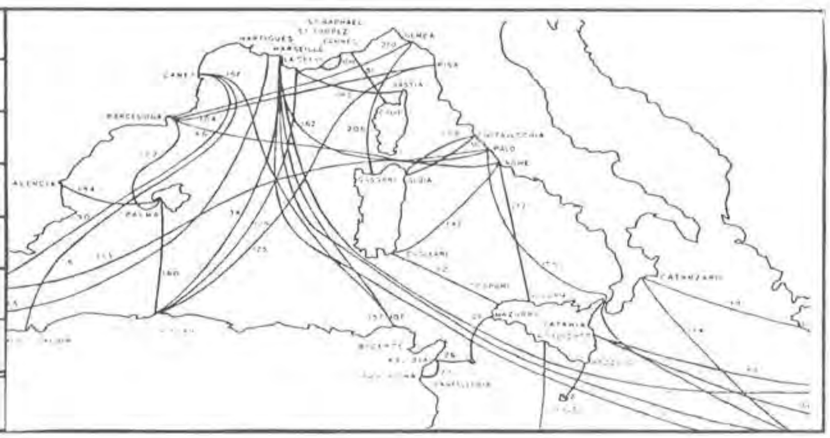
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	96	now 96	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Compagnie Industrielle de Télécomunications	CONSTRUCTION CONTRACTOR	CIT

POWER FEED MODE	double end	NOMINAL VOLTAGE	1500/1500	SYSTEM CURRENT	0.325 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	3.2
SUBMERGED ELECTRONICS	1.9
TERMINAL AND POWER FEED	0.5
TERMINAL STATIONS	0.5
INSTALLATION	0.4
TOTAL	6.5
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **108**

OFFICIAL NAME	Mori-Muroran 1		
OTHER NAMES	Uchiura Bay 1		
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Mori, Hokkaido	TERMINUS B	Muroran, Hokkaido
LANDING POINT A	Mori	LANDING POINT B	Muroran
COORDINATES A	42°6' N x 140°35' E	COORDINATES B	42°18' N x 141°0' E

OWNER	Nippon Telegraph & Telephone Public Corporation	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1969 | NATURE OF SERVICE commercial | CABLE MILES 19 | SINGLE OR TWIN single | SYSTEM TYPE CS-10M

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 0.70" 18.0 mm

CABLE MANUFACTURER Ocean Cable Company Limited (Japan) | CABLESHIP USED: TSUGARU MARU

REPEATER DESCRIPTION monocontainer flexible bidirectional transistorized | NUMBER OF REPEATERS 6 | REPEATER SPACING 3.3 nm

REPEATER MANUFACTURERS Nippon Electric Company and Fujitsu Ltd.

NOMINAL TRANSMISSION BANDWIDTH 3872+3872 kHz | TRANSMISSION FREQUENCIES 316-4188+5712-9584 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD -

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 900 now 900 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Nippon Electric Co. and Fujitsu Ltd. | CONSTRUCTION CONTRACTOR NTTPC

POWER FEED MODE double end | NOMINAL VOLTAGE 70/70 | SYSTEM CURRENT 0.090 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST N.A.*	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL *Prototype project	
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **109**

OFFICIAL NAME	St. Raphael - St. Tropez
OTHER NAMES	

COUNTRY A	France	COUNTRY B	France
TERMINUS A	St. Raphael	TERMINUS B	St. Tropez
LANDING POINT A	St. Raphael	LANDING POINT B	St. Tropez
COORDINATES A	43°24'N x 6°48'E	COORDINATES B	43°16'N x 6°39'E

OWNER	Administration of Posts and Telecommunications	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1970 | NATURE OF SERVICE commercial | CABLE MILES 15 | SINGLE OR TWIN single | SYSTEM TYPE S 5

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.00" 25.4mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIP USED: MARCEL BAYARD

REPEATER DESCRIPTION Monocontainer flexible bidirectional transistorized | NUMBER OF REPEATERS 2 | REPEATER SPACING 9nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications CIT - ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 1980+1980kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD -

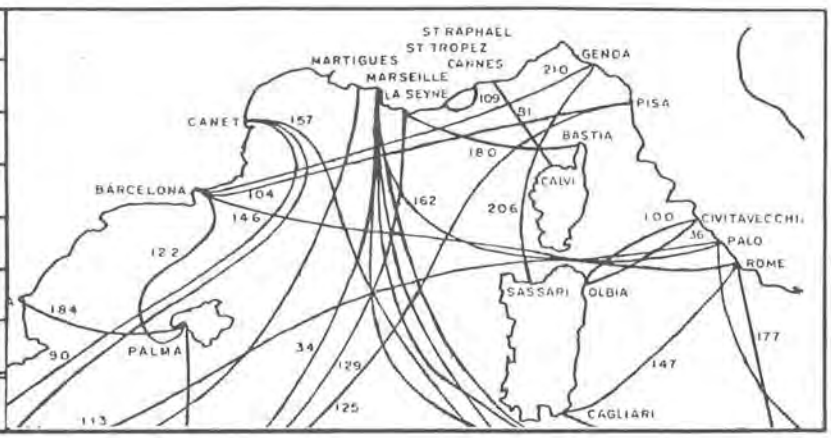
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT - ALCATEL | CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE single end | NOMINAL VOLTAGE 200 | SYSTEM CURRENT 0.180 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	0.3
SUBMERGED ELECTRONICS	1.4
TERMINAL AND POWER FEED	1.0
TERMINAL STATIONS	1.0
INSTALLATION	0.6
TOTAL	4.3
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

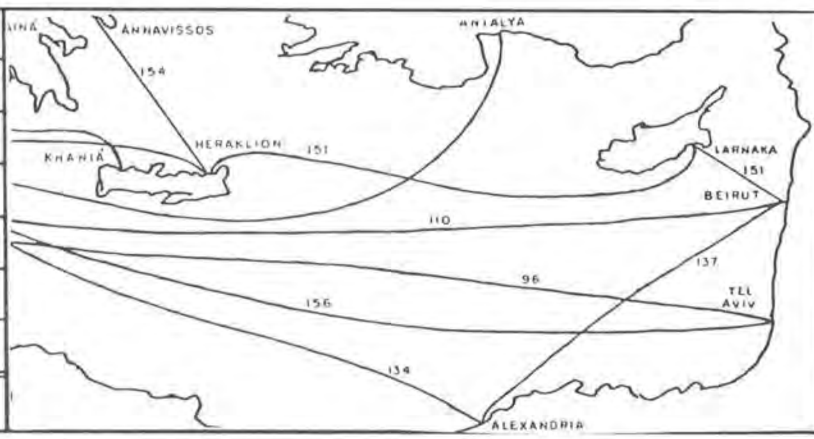
SYSTEM REFERENCE NUMBER **110**

OFFICIAL NAME	Marseille-Beirut		
OTHER NAMES	France-Lebanon		
COUNTRY A	France	COUNTRY B	Lebanon
TERMINUS A	Marseille	TERMINUS B	Beirut
LANDING POINT A	Marseille	LANDING POINT B	Beirut
COORDINATES A	43°16' N x 5°23' E	COORDINATES B	33°54' N x 35°30' E

OWNER	Societé de Développement des Télécomunications du Liban, SODETEL, a joint enterprise of France Câble et Radio and the government of Lebanon
I R U HOLDERS	DBP
CIRCUITS HELD	12
LESSEES	
CIRCUITS LEASED	

DATE IN SERVICE	1970
NATURE OF SERVICE	commercial
CABLE MILES	1837
SINGLE OR TWIN	single
SYSTEM TYPE	S I
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon
CABLESHIP USED:	MARCEL BAYARD
REPEATER DESCRIPTION	monocontainer flexible bidirectional
NUMBER OF REPEATERS	99
REPEATER SPACING	20 nm
REPEATER MANUFACTURER	Compagnie Industrielle de Télécomunications
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz
TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	9
EQUALIZATION METHOD	stepping switch
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160
NOW	160
CHANNEL SPACING, INITIAL	3 kHz
NOW	3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Cie Industrielle de Télécomunications
CONSTRUCTION CONTRACTOR	CIT
POWER FEED MODE	double end
NOMINAL VOLTAGE	1910/1910
SYSTEM CURRENT	0.090 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	12.11
SUBMERGED ELECTRONICS	8.04
TERMINAL AND POWER FEED	0.50
TERMINAL STATIONS	0.48
INSTALLATION	0.34
TOTAL	21.47
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **111**

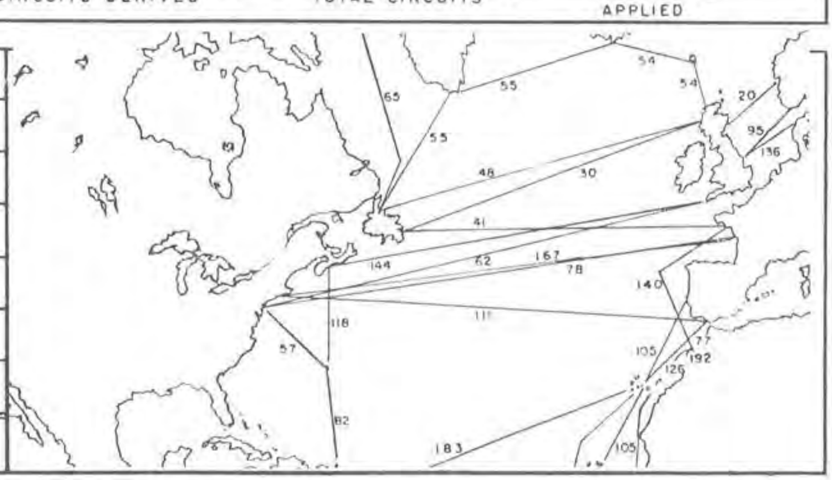
OFFICIAL NAME	Transatlantic No. 5	ACRONYM	TAT-5
OTHER NAMES	Green Hill - Conil		
COUNTRY A	U.S.A.	COUNTRY B	Spain
TERMINUS A	Green Hill, Rhode Island	TERMINUS B	Conil (Cadiz)
LANDING POINT A	Green Hill Pt.	LANDING POINT B	Conil
COORDINATES A	41°22' N x 71°36' W	COORDINATES B	36°17' N x 06°06' W

OWNER A	*	CIRCUITS HELD	*
OWNER B	*	CIRCUITS HELD	*
I R U HOLDERS	*		
CIRCUITS HELD	* see following page		
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1970	NATURE OF SERVICE	commercial	CABLE MILES	3461	SINGLE OR TWIN	single	SYSTEM TYPE	SF

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Western Electric Co., Standard Telephones & Cables, and Câbles de Lyon		
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized	NUMBER OF REPEATERS	361
REPEATER SPACING	10 nm		
REPEATER MANUFACTURER	Western Electric Company	CABLESHIPS USED:	LONG LINES, JOHN CABOT
NOMINAL TRANSMISSION BANDWIDTH	2160+2160 kHz	TRANSMISSION FREQUENCIES	554-2920+3575-5894 kHz
NUMBER OF EQUALIZERS	17	EQUALIZATION METHOD	switched networks
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	720 now 845	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Co.	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	2775/2775
SYSTEM CURRENT	0.136 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST	$ MILLION
CABLE	39.6
SUBMERGED ELECTRONICS	26.2
TERMINAL AND POWER FEED	7.4
TERMINAL STATIONS	2.4
INSTALLATION	3.4
TOTAL	79.0
SYSTEM DESIGN LIFE	24 years



ALLOCATIONS

	ATT	AACRPR	CDT	FTCC	ITTWC	RCAGC	TGC	TRTT	WUI
CTNE	64	7	4		8	6	3	1	7
CPRM	29				2	2			1
ITALCABLE	123	1			5	9	14	1	8
Austria	8				2	1			2
BPO					10	10			9
Belgium	13				7	5			4
Brazil	9				1	2			2
Cyprus	1								
Czechoslovakia	7								
Denmark	2								
Egypt					1				
Finland	2				1				
France	38			4	2	1			1
Germany, Dem. Rep.									2
Germany, Fed. Rep.	56				3	4			4
Greece	9				1	1			
Hungary	2				1				
Indonesia						1			
Ireland	8				1				2
Israel	23								
Kenya	5								
Lebanon	9				1	2			2
Luxembourg	4								
Netherlands	15					5			1
Norway	7					1			
Pakistan	3				1				
Saudi Arabia									3
Sweden	15				2	1			2
Switzerland	17				9	12		1	3
Tunisia	1					1			
Turkey	2					1			
South Africa	28				1	2			
U.S.S.R.	3				1				1
Yugoslavia						1			

SEACABLE SYSTEM DATA PROFILE

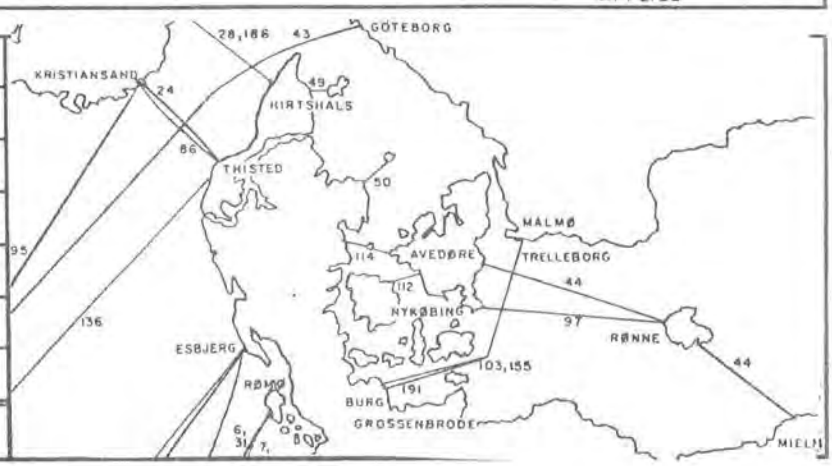
SYSTEM REFERENCE NUMBER **112**

OFFICIAL NAME	Copenhagen - Kolding		
	(An overland system with a submerged portion with repeaters)		
COUNTRY A	Denmark	COUNTRY B	Denmark
TERMINUS A	Kristianslund	TERMINUS B	Halsskov
	This is the submerged portion of a system between Copenhagen and Kolding		

OWNER	Administration of Posts and Telegraphs	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1970	NATURE OF SERVICE	commercial	CABLE MILES	10.2	SINGLE OR TWIN	twin multi-tube cables	SYSTEM TYPE	12 MHz
CABLE DESCRIPTION	6 polyethylene coaxials cabled and armored					CABLE SIZE	4.1/15.0 mm		
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG			CABLESHIP USED: PETER FABER (2)					
REPEATER DESCRIPTION	monocontainer inflexible multi-amplifier transistorized					NUMBER OF REPEATERS	6	REPEATER SPACING	3 nm
REPEATER MANUFACTURER	N.V. Philips' Telecommunicatie Industrie and U. S. Underseas Cable Corporation								
NOMINAL TRANSMISSION BANDWIDTH	12076+12076			TRANSMISSION FREQUENCIES	312-12388+312-12388 kHz				
NUMBER OF EQUALIZERS	none submerged			EQUALIZATION METHOD	-				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	16200	now	16200	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Philips					CONSTRUCTION CONTRACTOR	F&G		
POWER FEED MODE	special	NOMINAL VOLTAGE	-			SYSTEM CURRENT	0.050 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **113**

OFFICIAL NAME	Mediterranean-Atlantic 1	ACRONYM	MAT 1
OTHER NAMES	Estepona - Palo	Spain - Italy 2	
COUNTRY A	Spain	COUNTRY B	Italy
TERMINUS A	Estepona, Malaga	TERMINUS B	Palo (Rome)
LANDING POINT A	Fstepona Beach	LANDING POINT B	Palo
COORDINATES A	36°27' N x 5°5' W	COORDINATES B	41°55' N x 12°07' E

OWNER A	Compañía Telefónica Nacional de España	CIRCUITS HELD *
OWNER B	ITALCABLE Servizi Cablografici Radiotelegrafici	CIRCUITS HELD *
I R U HOLDERS *		
CIRCUITS HELD *	see following page	
LESSEES	none	
CIRCUITS LEASED		

DATE IN SERVICE	1970	NATURE OF SERVICE	commercial	CABLE MILES	986	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.	CABLESHIPS USED:	MERCURY LONG LINES

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	93	REPEATER SPACING	11 nm

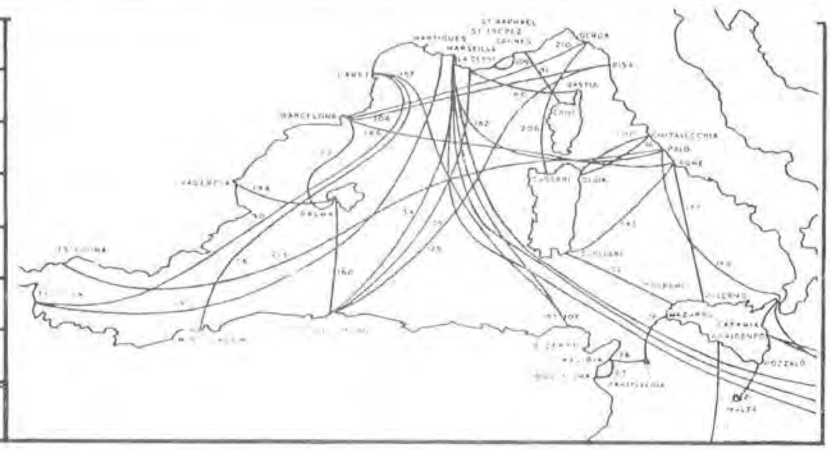
REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	7	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480 now 640	CHANNEL SPACING, INITIAL	4 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	1250/1250	SYSTEM CURRENT	0.150 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	7.2
SUBMERGED ELECTRONICS	6.1
TERMINAL AND POWER FEED	1.2
TERMINAL STATIONS	0.9
INSTALLATION	1.2
TOTAL	16.6
SYSTEM DESIGN LIFE	25 years



113
continued

ALLOCATION

American Telephone and Telegraph Company	50
with	
ITALCABLE	129
Austria	8
Cyprus	1
Czechoslovakia	1
Egypt	2
Germany, Fed. Rep.	20
Greece	9
Hungary	2
Israel	4
Lebanon	4
Libya	2
Switzerland	17
Turkey	2
U. S. S. R.	3
Cía. Telefónica Nacional de España	
with	
Teleglobe Canada	19
SACC	27
Morocco	13
ITALCABLE	8
with	
TGC	19
TRTT	1
RCAGC	11
WUI	10
CPRM	28
ITTWC	9
ITTCVI	1

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **114**

OFFICIAL NAME	Copenhagen-Aarhus		
	(An overland cable system with submerged portions with repeaters)		
COUNTRY A	Denmark	COUNTRY B	Denmark
TERMINUS A	Copenhagen	TERMINUS B	Ormslev
	There are two submerged portions of this system, 8.7 nm between Kysing Naes and Kolsøre Hage, and 8.7 nm between Vorres Hage and Røsnaes.		

OWNER	Administration of Posts and Telegraphs	CIRCUITS HELD	all
	-		
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1970	NATURE OF SERVICE	commercial	CABLE MILES	17.4 submerged	SINGLE OR TWIN	twin multi-tube cables	SYSTEM TYPE	12 MHz

CABLE DESCRIPTION	6 polyethylene coaxials cabled and armored	CABLE SIZE	4.1/15.0 mm
CABLE MANUFACTURER	Norddeutsche Seekabelwerke AG	CABLESHIP USED:	PETER FABER (2)

REPEATER DESCRIPTION	monocontainer inflexible multi-amplifier transistorized	NUMBER OF REPEATERS	8 submerged	REPEATER SPACING	3 nm

REPEATER MANUFACTURER: N.V. Philips' Telecommunicatie Industrie and U.S. Underseas Cable Corporation

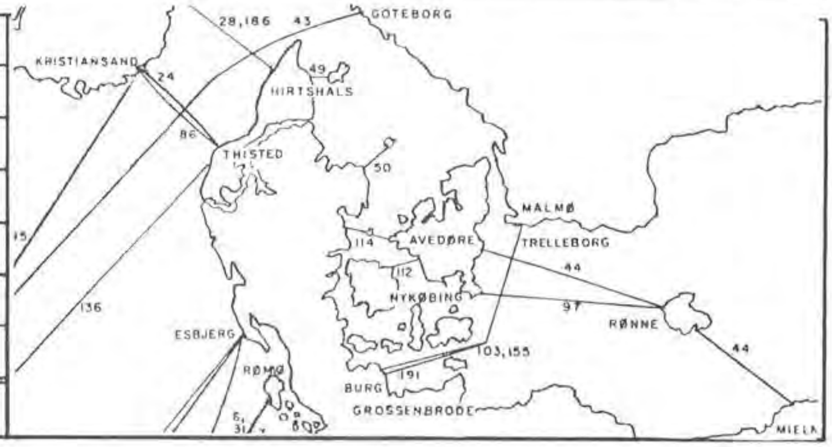
NOMINAL TRANSMISSION BANDWIDTH	12076+12076	TRANSMISSION FREQUENCIES	312-12388+312-12388 kHz
NUMBER OF EQUALIZERS	none submerged	EQUALIZATION METHOD	-

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	16200	now 16200	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Philips			CONSTRUCTION CONTRACTOR	F&G
POWER FEED MODE	special	NOMINAL VOLTAGE	-	SYSTEM CURRENT	0.050 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **115**

OFFICIAL NAME	Kure-Matsuyama 1 and 2 (parallel systems)		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Kure, Hiroshima, Honshu	TERMINUS B	Matsuyama, Ehime, Shikoku
LANDING POINT A	Suruga	LANDING POINT B	Asanami
COORDINATES A	34°17' N x 132°32' E	COORDINATES B	33°50' N x 132°22' E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	CABLE MILES	17 + 17	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36MS
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	0.70" 18.0 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited	CABLESHIP USED:	TSUGARU MARU						
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized			NUMBER OF REPEATERS	11+11	REPEATER SPACING	1.4 nm		
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Limited								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672	TRANSMISSION FREQUENCIES	4332-17004 + 22796-35468kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	–						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700 each	NOW	2700 each	CHANNEL SPACING, INITIAL	4 kHz	NOW	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Nippon Electric Co. Ltd. and Fujitsu Ltd.	CONSTRUCTION CONTRACTOR	NTTPC						
POWER FEED MODE	double end	NOMINAL VOLTAGE	200/200	SYSTEM CURRENT	0.156 A				
TASI TYPE	–	CIRCUITS USED	–	CIRCUITS DERIVED	–	TOTAL CIRCUITS	–	DATE APPLIED	–

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	Prototype project
SYSTEM DESIGN LIFE	20 years

RETIRED 1976

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **116**

OFFICIAL NAME	Sagami Bay Loop 1		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Yahatano	TERMINUS B	Yahatano
LANDING POINT A	Yahatano	LANDING POINT B	Yahatano
COORDINATES A	$34^{\circ}50'N \times 139^{\circ}08'E$	COORDINATES B	$34^{\circ}50'N \times 139^{\circ}08'E$

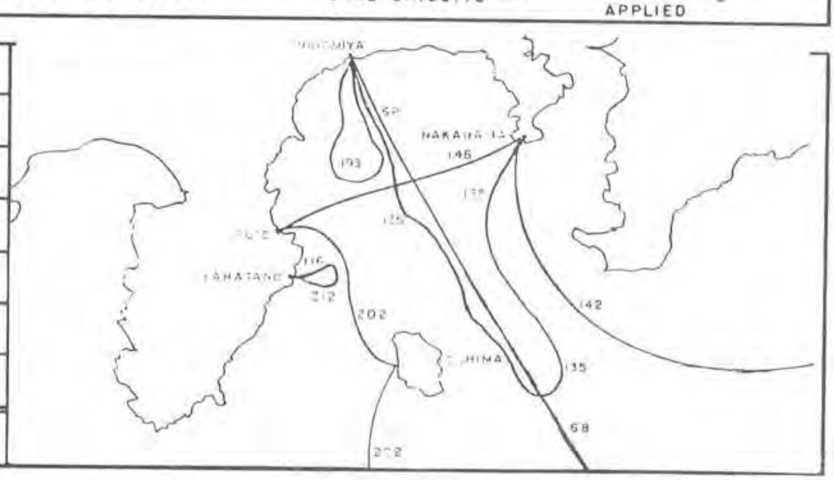
OWNER	Nippon Telephone & Telegraph Public Corporation	CIRCUITS HELD	all
	-		
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1971	NATURE OF SERVICE	experimental	CABLE MILES	13	SINGLE OR TWIN	single	SYSTEM TYPE	CS 36M D1

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Limited	CABLESHIP USED:	TSUGARU MARU
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized	NUMBER OF REPEATERS	4
REPEATER SPACING	2.6 nm		
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited		
NOMINAL TRANSMISSION BANDWIDTH	12672+12672	TRANSMISSION FREQUENCIES	4332-17004+22796-35468 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700 now 2700	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu	CONSTRUCTION CONTRACTOR	NTTPC
POWER FEED MODE	double end	NOMINAL VOLTAGE	100/100
SYSTEM CURRENT	0.156 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	prototype project
SYSTEM DESIGN LIFE	25 years



NOT IN SERVICE

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **117**

OFFICIAL NAME	Taiwan-Okinawa	ACRONYM	IJCS
OTHER NAMES	Integrated Joint Communication System No. 1		
COUNTRY A	Taiwan	COUNTRY B	Okinawa
TERMINUS A	Camp McCauley	TERMINUS B	Fort Buckner
LANDING POINT A	Camp McCauley	LANDING POINT B	Futenma
COORDINATES A	25°13' N x 121°39' E	COORDINATES B	26°18' N x 127°46' E

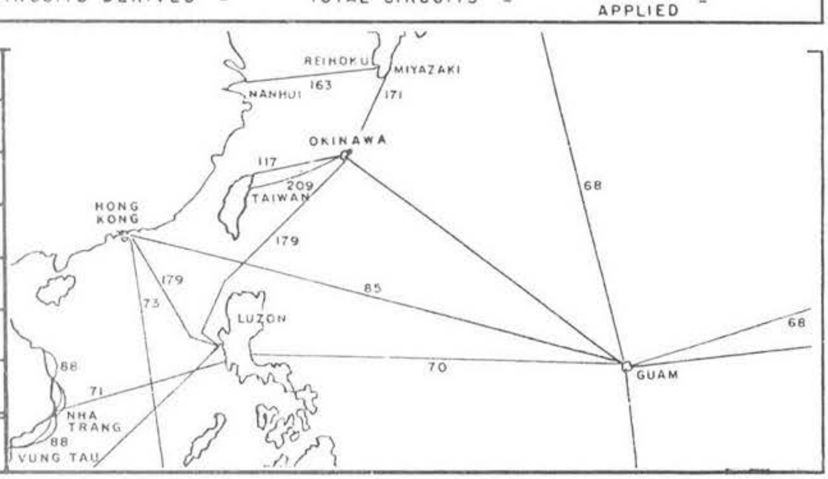
OWNER (when built) U.S. Government — CIRCUITS HELD all

The system was retired from service prior to 1980, in which year the U. S. Government Surplus Property Office offered the system for sale by international tender. It was purchased by private interests.

DATE IN SERVICE	1971	NATURE OF SERVICE	military	CABLE MILES	363	SINGLE OR TWIN	single	SYSTEM TYPE	Z60S

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	0.62" 15.7 mm
CABLE MANUFACTURER	Simplex Wire & Cable Company	CABLESHIPS USED:	NEPTUN (3), OMEGA
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	21
REPEATER SPACING	17 nm		
REPEATER MANUFACTURER	U. S. Underseas Cable Corporation		
NOMINAL TRANSMISSION BANDWIDTH	240+240 kHz	TRANSMISSION FREQUENCIES	24-264+312-552 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	60 now 60	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	TEKADE-F&G Fernmelde-anlagen GmbH	CONSTRUCTION CONTRACTOR	USUCC
POWER FEED MODE	single end	NOMINAL VOLTAGE	2000
SYSTEM CURRENT	0.426 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST	$ MILLION
CABLE	1.7
SUBMERGED ELECTRONICS	1.1
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	0.7
INSTALLATION	0.7
TOTAL	5.1
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

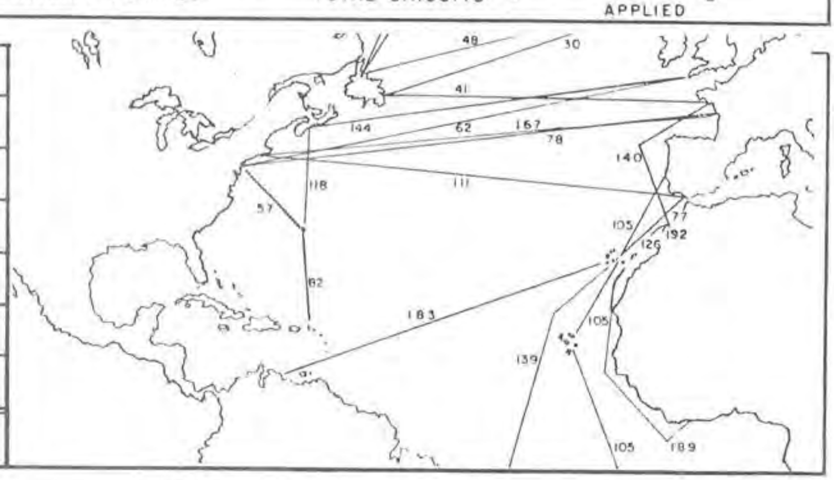
SYSTEM REFERENCE NUMBER **118**

OFFICIAL NAME	Mill Village-Bermuda	ACRONYM	CANBER
OTHER NAMES	Canada-Bermuda		
COUNTRY A	Canada	COUNTRY B	Bermuda, B.C.C.
TERMINUS A	Mill Village, Nova Scotia	TERMINUS B	Flatts
LANDING POINT A	Medway Harbour	LANDING POINT B	Sue Wood Bay
COORDINATES A	44°9' N x 64°40' W	COORDINATES B	32°18' N x 64°44' W

OWNER A	Canadian Overseas Telecommunications Corporation*	CIRCUITS HELD	480h
OWNER B	Cable & Wireless Limited	CIRCUITS HELD	480h
I R U HOLDERS			
CIRCUITS HELD			
	* now Teleglobe Canada		

DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	CABLE MILES	825	SINGLE OR TWIN	single	SYSTEM TYPE	TMkI		
CABLE DESCRIPTION	unarmored polyethylene coaxial							CABLE SIZE	1.47" 37.3 mm		
CABLE MANUFACTURER	Submarine Cables Limited			CABLESHIP USED:	MERCURY						
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized					NUMBER OF REPEATERS	81	REPEATER SPACING	11 nm		
REPEATER MANUFACTURER	Submarine Cables Limited										
NOMINAL TRANSMISSION BANDWIDTH	1988+1988 kHz			TRANSMISSION FREQUENCIES	308-2296+2788-4776 kHz						
NUMBER OF EQUALIZERS	5			EQUALIZATION METHOD	adjust on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480		CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz					
TERMINAL EQUIPMENT MANUFACTURER	Associated Electrical Industries, Ltd.			CONSTRUCTION CONTRACTOR	SCL						
POWER FEED MODE	double end			NOMINAL VOLTAGE	930/930	SYSTEM CURRENT	0.150 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	6.7
SUBMERGED ELECTRONICS	5.1
TERMINAL AND POWER FEED	1.3
TERMINAL STATIONS	0.9
INSTALLATION	1.0
TOTAL	15.0
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **119**

OFFICIAL NAME	U.K. - Spain 1	ACRONYM	UK-SP 1
OTHER NAMES	England-Spain No. 1 Algorta-Goonhilly A		
COUNTRY A	England	COUNTRY B	Spain
TERMINUS A	Goonhilly Downs, Cornwall	TERMINUS B	Algorta (Bilbao)
LANDING POINT A	Kennack Sands	LANDING POINT B	Azcorri Beach
COORDINATES A	50°01'N x 5°08'W	COORDINATES B	43°23' N x 3° 1' W

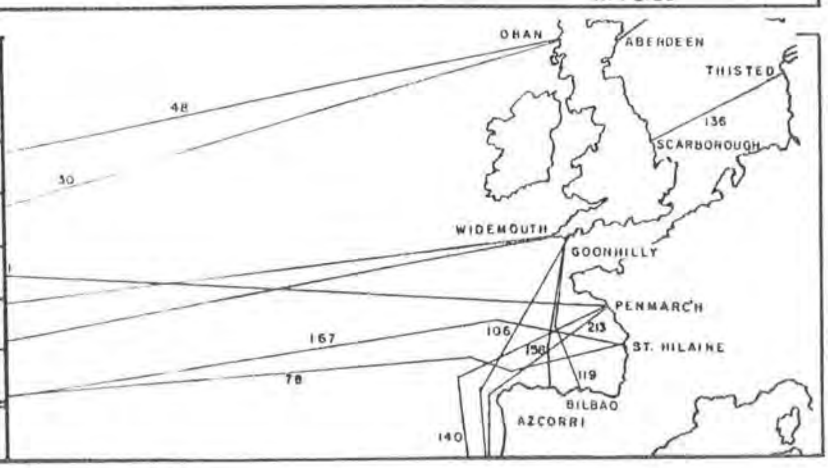
OWNER A	British Post Office	CIRCUITS HELD	480h
OWNER B	Compania Telefonica Nacional de Espana	CIRCUITS HELD	480h

I R U HOLDERS	DBP	CPRM	CTNE	Belgium	Netherlands	Sweden
CIRCUITS HELD	48	60	144	48	36	12
LESSEES	various					
CIRCUITS LEASED	9					

DATE IN SERVICE	1970	NATURE OF SERVICE	commercial	CABLE MILES	482	SINGLE OR TWIN	single	SYSTEM TYPE	NC (Y)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	52
REPEATER SPACING	11 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480 now 480	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE	725/725
SYSTEM CURRENT	0.150 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST Estimated	$ MILLION
CABLE	2.90
SUBMERGED ELECTRONICS	1.95
TERMINAL AND POWER FEED	0.35
TERMINAL STATIONS	0.10
INSTALLATION	0.30
TOTAL	5.60
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **120**

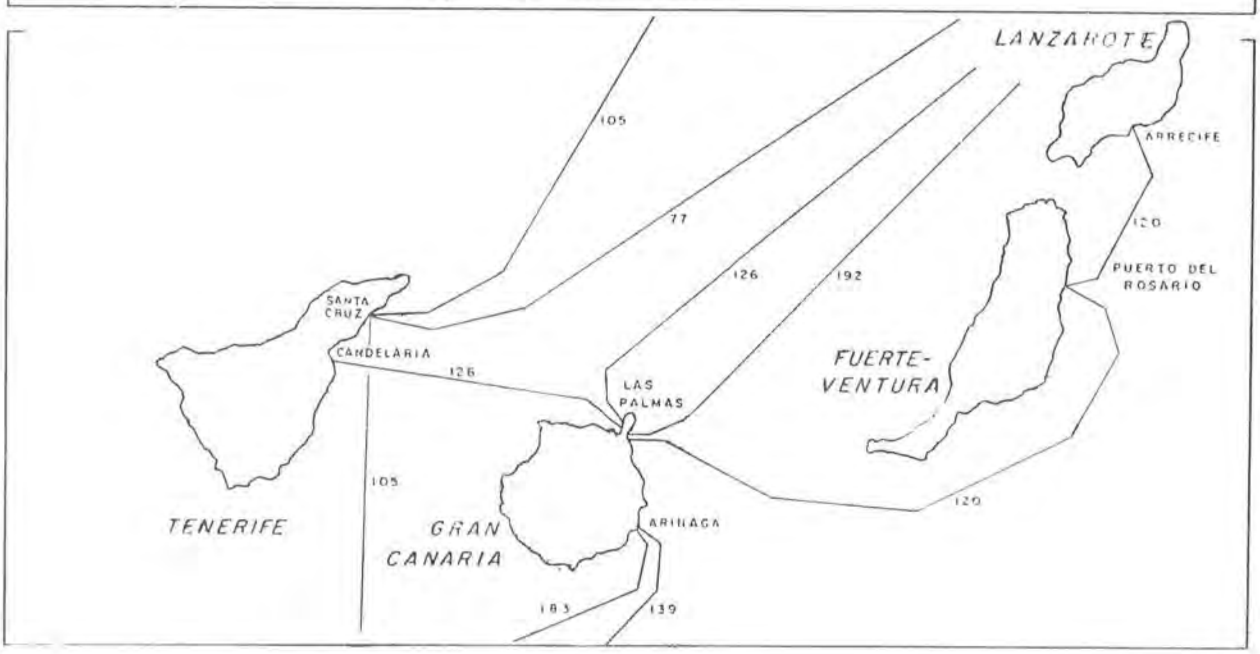
OFFICIAL NAME	Trans-Canary Cable	ACRONYM	TRANSCAN
OTHER NAMES	Canary Inter-Island Cable	Gran Canaria-Fuerteventura-Lanzarote	

COUNTRY A	Spain (Canary Is.)	COUNTRY B	Spain (Canary Is.)
TERMINUS A	Las Palmas, Gran Canaria	TERMINUS B	Puerto del Rosario, (Fuerteventura)
LANDING POINT A	San Cristóbal (Las Palmas)	LANDING POINT B	Playa Blanca
COORDINATES A	28°5' N x 15°25' W	COORDINATES B	28°29' N x 13°52' W

COUNTRY C	Spain (Canary Is.)	COUNTRY D	
TERMINUS C	Arrecife, Lanzarote	TERMINUS D	
LANDING POINT C	Playa del Cable	LANDING POINT D	
COORDINATES C	28°56' N x 13°34' W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 143	B C 44					
DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5M)
CABLE DESCRIPTION	unarmored polyethylene coaxial				CABLE SIZE	0.99"	25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



OWNERS	Compañía Telefónica Nacional de España
CIRCUITS HELD	all
I.R.U. HOLDERS	none
CIRCUITS HELD	
LESSEES	none
CIRCUITS LEASED	

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized						REPEATER SPACING	7.6 nm
NUMBER OF REPEATERS	A B	19	B C	6				
REPEATER MANUFACTURER	Standard Telephones & Cables Limited							
NUMBER OF EQUALIZERS	A B	1	B C	none				
EQUALIZATION METHOD	adjusted on board							
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited							
POWER FEED MODE	ABC single end							
NOMINAL VOLTAGE	800						SYSTEM CURRENT	0.150 A
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz						TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now	480	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz	
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED -
REMARKS	A Stations: AB-Puerto del Rosario BC-Arrecife							

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited	CABLESHIP USED:	JOHN W MACKAY

COST Estimated	$ MILLION
CABLE	1.7
SUBMERGED ELECTRONICS	0.8
TERMINAL AND POWER FEED	0.6
TERMINAL STATIONS	0.4
INSTALLATION	0.3
TOTAL	3.8
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **121**

OFFICIAL NAME	Kingston-Grand Cayman		
OTHER NAMES	Jamaica-Cayman		
COUNTRY A	Jamaica	COUNTRY B	Cayman Islands
TERMINUS A	Prospect Pen	TERMINUS B	Georgetown, Grand Cayman
LANDING POINT A	Prospect Pen	LANDING POINT B	Georgetown
COORDINATES A	19°17' N x 81°23' W	COORDINATES B	17°57' N x 76°47' W

OWNER A	Jamaica International Telecommunications Ltd.	CIRCUITS HELD	
OWNER B	Cable & Wireless Limited	CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1971 — NATURE OF SERVICE commercial — CABLE MILES 388 — SINGLE OR TWIN single — SYSTEM TYPE U Mk I

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 0.99" 25.1 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited — CABLESHIP USED: MERCURY

REPEATER DESCRIPTION monocontainer inflexible bidirectional — NUMBER OF REPEATERS 23 — REPEATER SPACING 18 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 492+492 kHz — TRANSMISSION FREQUENCIES 60-552+672-1164 kHz

NUMBER OF EQUALIZERS 2 — EQUALIZATION METHOD adjusted on board

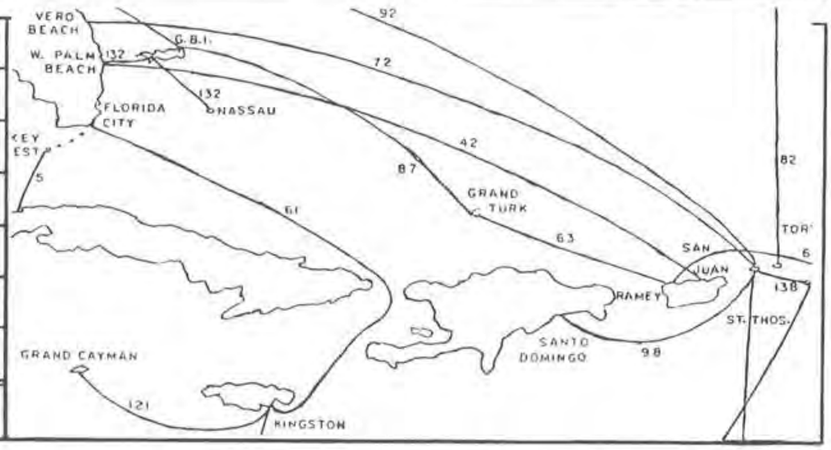
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 160 now 160 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR C&W

POWER FEED MODE double end — NOMINAL VOLTAGE 1300/1300 — SYSTEM CURRENT 0.415 A

TASI TYPE – CIRCUITS USED – CIRCUITS DERIVED – TOTAL CIRCUITS – DATE APPLIED –

COST	$ MILLION
CABLE	1.2
SUBMERGED ELECTRONICS	0.9
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.6
INSTALLATION	0.4
TOTAL	3.5
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **122**

OFFICIAL NAME	Peninsula - Balearic Islands 1	ACRONYM	PENBAL 1
OTHER NAMES	Barcelona - Palma de Mallorca		
COUNTRY A	Spain (Balearic Islands)	COUNTRY B	Spain (mainland)
TERMINUS A	Palma de Mallorca	TERMINUS B	Barcelona
LANDING POINT A	Cala Mayor	LANDING POINT B	Barceloneta Beach
COORDINATES A	39°33'N x 02°36'E	COORDINATES B	41°23'N x 02°12'E

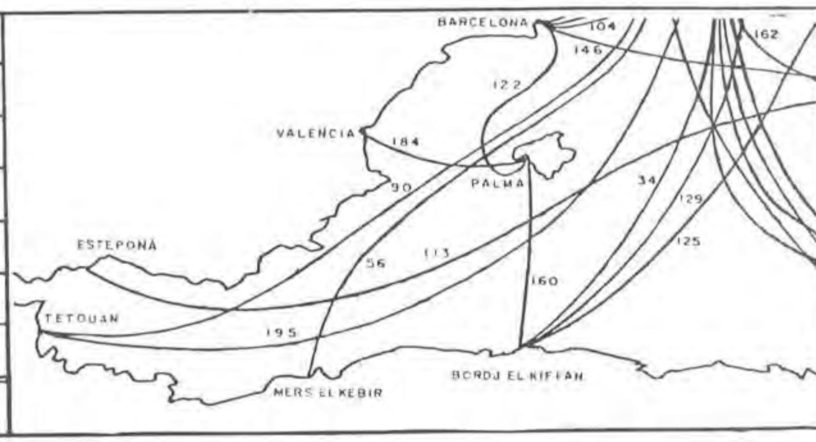
OWNER	Compañía Telefónica Nacional de España	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	CABLE MILES	183	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited				
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	28	REPEATER SPACING	6.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited.	CABLESHIP USED:	JOHN W MACKAY		
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz		
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	computed and assembled on board		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900 now 1380	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	475/475	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	1.8
SUBMERGED ELECTRONICS	1.5
TERMINAL AND POWER FEED	0.5
TERMINAL STATIONS	0.4
INSTALLATION	0.3
TOTAL	4.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **123**

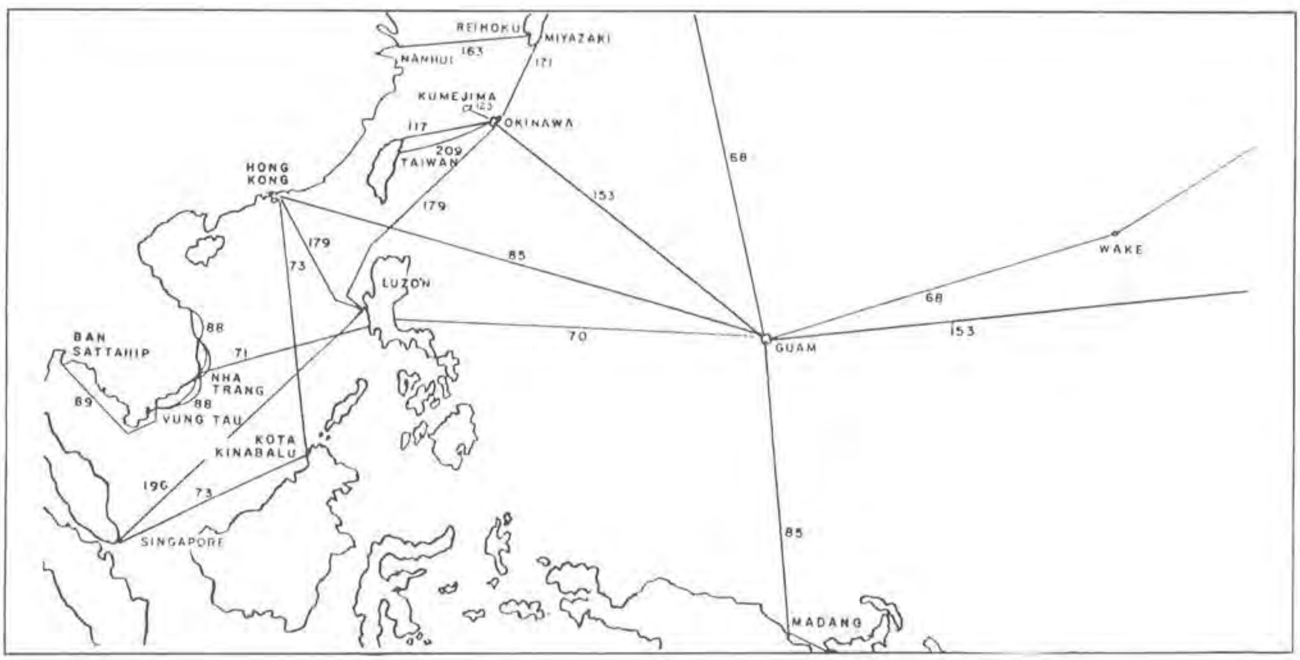
OFFICIAL NAME	Okinawa - Zamami - Kumejima
OTHER NAMES	

COUNTRY A	Japan (Okinawa)	COUNTRY B	Japan (Zamamijima)
TERMINUS A	Ginowan	TERMINUS B	Zamami
LANDING POINT A	Ginowan	LANDING POINT B	Zamami
COORDINATES A	$26^{\circ}09'$N x $127^{\circ}44'$E	COORDINATES B	$26^{\circ}14'$N x $127^{\circ}19'$E

COUNTRY C	Japan (Kumejima)	COUNTRY D	
TERMINUS C	Gima	TERMINUS D	
LANDING POINT C	Gima	LANDING POINT D	
COORDINATES C	$26^{\circ}20'$N x $126^{\circ}46'$E	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 26	B C 38					
DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	CS 10M
CABLE DESCRIPTION	armored polyethylene coaxial			CABLE SIZE	0.70"	18.0mm	
CABLE MANUFACTURER	Ocean Cable Company Limited						



123
continued

OWNER	Nippon Telegraph and Telephone Public Corporation
CIRCUITS HELD	All
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	REPEATER SPACING	3.3 nm
NUMBER OF REPEATERS	A B 8 B C 10		
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited		
NUMBER OF EQUALIZERS	A B none B C none		
EQUALIZATION METHOD	-		
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu		
POWER FEED MODE	A B double end B C double end		
NOMINAL VOLTAGE	100/100 150/150	SYSTEM CURRENT	0.090 A
NOMINAL TRANSMISSION BANDWIDTH	3716 + 3716 kHz	TRANSMISSION FREQUENCIES	312-4028+5872-9588 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900 now 900	CHANNEL SPACING,	INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -
REMARKS	CABLESHIP USED: TSUGARU MARU		

CONSTRUCTION CONTRACTOR	Nippon Telegraph and Telephone Public Corporation

COST $ MILLION	AB	BC
CABLE	0.17	0.26
SUBMERGED ELECTRONICS	0.41	0.62
TERMINAL AND POWER FEED	0.19	0.29
TERMINAL STATIONS	0.17	0.25
INSTALLATION	0.08	0.12
TOTAL	1.02	1.54
SYSTEM DESIGN LIFE	20 years	

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **124**

OFFICIAL NAME	Winterton-Fedderwarden		
OTHER NAMES	Winterton-Spiekeroog	Fedderwarden-Winterton A	
COUNTRY A	England	COUNTRY B	Federal Republic of Germany
TERMINUS A	Winterton, Norfolk	TERMINUS B	Fedderwarden
LANDING POINT A	Winterton	LANDING POINT B	Spiekeroog-Carolinensiel
COORDINATES A	$52^{\circ}43'$ N x $1^{\circ}42'$ E	COORDINATES B	$53^{\circ}47'$ N x $7^{\circ}42'$ E

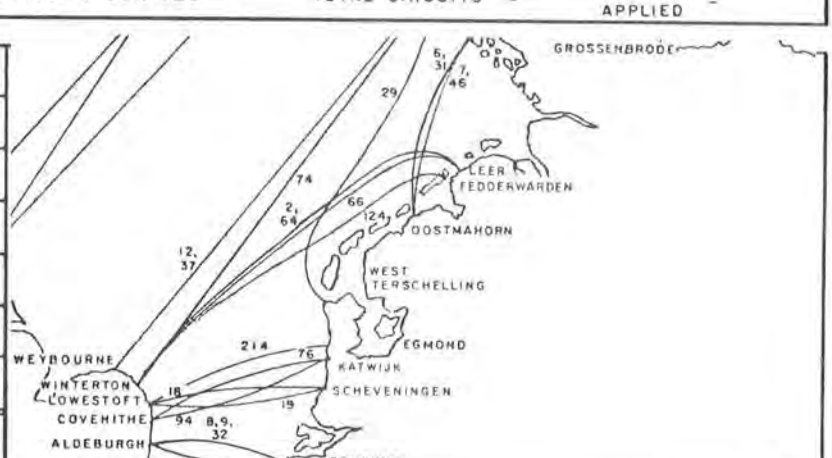
OWNER A	British Post Office	CIRCUITS HELD	1260h
OWNER B	Deutsche Bundespost	CIRCUITS HELD	1260h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	285	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	45	REPEATER SPACING	7 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz		
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	computed and assembled on board		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1260	now 1260	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	500/500	SYSTEM CURRENT	0.495 A
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED	-

COST	$ MILLION
CABLE	3.12
SUBMERGED ELECTRONICS	3.00
TERMINAL AND POWER FEED	0.22
TERMINAL STATIONS	0.02
INSTALLATION	0.16
TOTAL	6.52
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **125**

OFFICIAL NAME	Pisa-Algiers		
OTHER NAMES			
COUNTRY A	Italy	COUNTRY B	Algeria
TERMINUS A	Pisa	TERMINUS B	Bordj El Kiffan
LANDING POINT A	Marina di Pisa	LANDING POINT B	Bordj El Kiffan
COORDINATES A	43°38' N x 10°17' E	COORDINATES B	36°53' N x 3°2' E

OWNER A	Azienda di Stato per i Servizi Telefonici	CIRCUITS HELD	444h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	480h
I R U HOLDERS	Deutsche Bundespost		
CIRCUITS HELD	36		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1972 | NATURE OF SERVICE commercial | CABLE MILES 580 | SINGLE OR TWIN single | SYSTEM TYPE Y S5

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.47" 37.3 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited | CABLESHIP USED: MERCURY

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized | NUMBER OF REPEATERS 57 | REPEATER SPACING 11 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 4 | EQUALIZATION METHOD adjusted on board

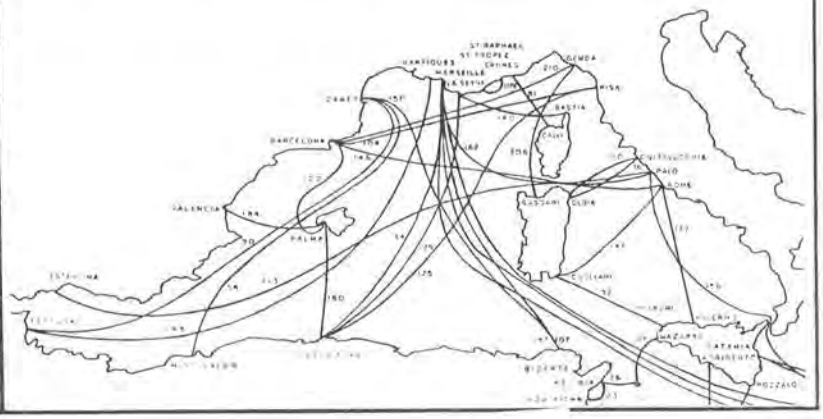
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. | CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end | NOMINAL VOLTAGE 800/800 | SYSTEM CURRENT 0.150 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	5.80
SUBMERGED ELECTRONICS	3.07
TERMINAL AND POWER FEED	0.52
TERMINAL STATIONS	0.43
INSTALLATION	0.38
TOTAL	10.20
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **126** A

OFFICIAL NAME	Peninsula - Canary Islands 2	ACRONYM	PENCAN 2
OTHER NAMES	Conil, Cadiz - Las Palmas de Gran Canaria		
COUNTRY A	Spain (Canary Is.)	COUNTRY B	Spain (mainland)
TERMINUS A	Las Palmas, Gran Canaria	TERMINUS B	Conil (Cádiz)
LANDING POINT A	Las Canteras	LANDING POINT B	Conil Beach
COORDINATES A	28°8' N x 15°27' W	COORDINATES B	36°16' N x 6°6' W

OWNER: Compañía Telefónica Nacional de España with below-listed IRU-holders

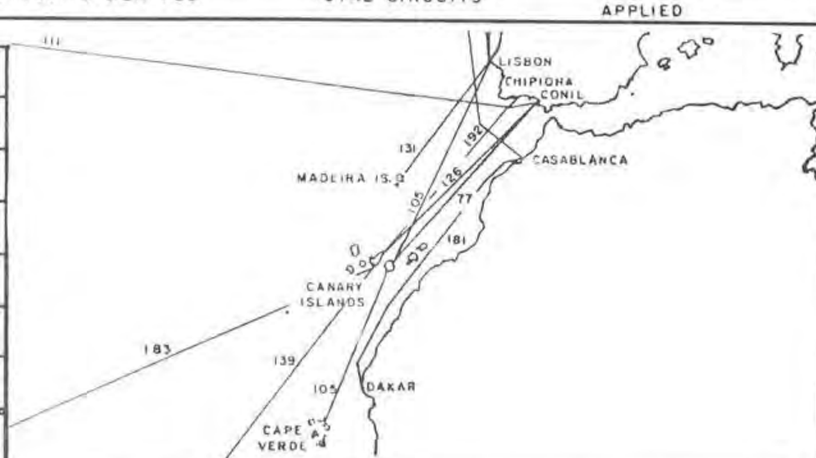
DBP	PTT Austria	CPRM	EMBRATEL	PTT France	ITALCABLE	Radio Austria	RCAGC
16	5	16	120	18	40	1	4
		ITTWC	SACC	PTT CH	KDD		
		2	16	18	16		

CIRCUITS LEASED

DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	CABLE MILES	737	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS / REPEATER SPACING	116 / 6.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	7	EQUALIZATION METHOD	compute and assemble on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1200 now 1840	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	STC	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE / SYSTEM CURRENT	1700/1700 / 0.500 A
TASI TYPE - CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST Estimated	$ MILLION
CABLE	8.6
SUBMERGED ELECTRONICS	7.5
TERMINAL AND POWER FEED	0.5
TERMINAL STATIONS	0.4
INSTALLATION	0.5
TOTAL	17.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **126** B

OFFICIAL NAME	Las Palmas - Tenerife	ACRONYM	PENCAN 2 EXT
OTHER NAMES	PENCAN 2 Extension		
COUNTRY A	Spain (Canary Is.)	COUNTRY B	Spain (Canary Is.)
TERMINUS A	Las Palmas, Gran Canaria	TERMINUS B	Candelaria, Tenerife
LANDING POINT A	Las Canteras	LANDING POINT B	Candelaria Beach
COORDINATES A	$28^{o}8'$ N x $15^{o}27'$ W	COORDINATES B	$28^{o}21$ N x $16^{o}22'$ W

OWNER	Compañía Telefónica Nacional de España	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	60	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	9	REPEATER SPACING	6.5 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-

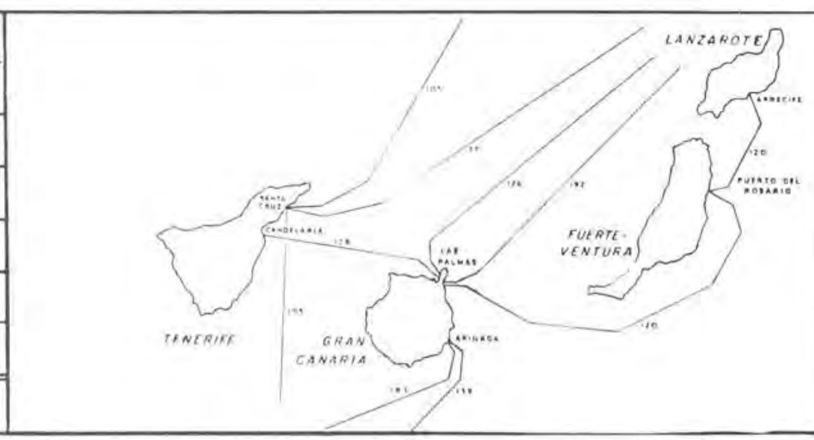
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1840	now 1840	CHANNEL SPACING, INITIAL	3 kHz	now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER	STC	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	160/160	SYSTEM CURRENT	0.495 A

TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST Estimated	$ MILLION
CABLE	0.6
SUBMERGED ELECTRONICS	0.5
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.2
INSTALLATION	0.1
TOTAL	1.8
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

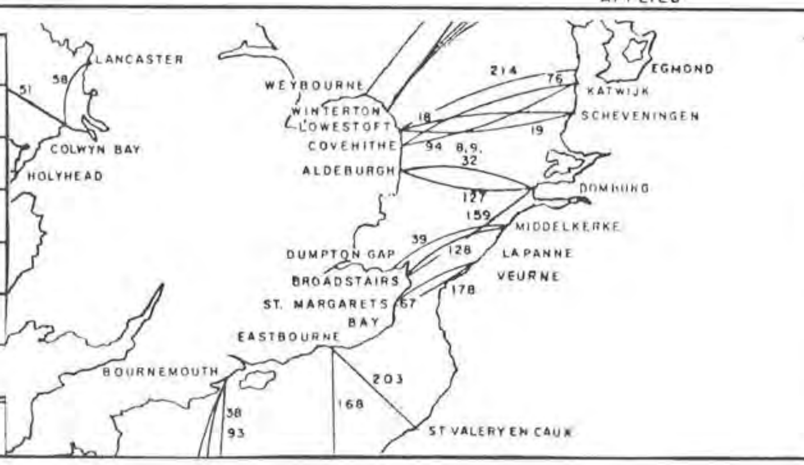
SYSTEM REFERENCE NUMBER **127**

OFFICIAL NAME	Aldeburgh-Domburg 7	ACRONYM	ALD - DOM 7
OTHER NAMES	U.K.-Netherlands Aldeburgh-Domburg D		
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Aldeburgh, Suffolk	TERMINUS B	Domburg, Walcheren
LANDING POINT A	Aldeburgh	LANDING POINT B	Domburg
COORDINATES A	$52^{\circ}10'$N x $1^{\circ}36'$ E	COORDINATES B	$51^{\circ}34'$ N x $3^{\circ}30'$ E

OWNER A	British Post Office	CIRCUITS HELD	1260h
OWNER B	Administration of PTT	CIRCUITS HELD	660h
I R U HOLDERS	DBP	Belgium	
CIRCUITS HELD	360	240	

DATE IN SERVICE 1972	NATURE OF SERVICE commercial	CABLE MILES 83	SINGLE OR TWIN single	SYSTEM TYPE NE (14M)
CABLE DESCRIPTION armored polyethylene coaxial			CABLE SIZE 1.47" 37.3 mm	
CABLE MANUFACTURER Standard Telephones & Cables Limited.		CABLESHIP USED: ALERT (4)		
REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized		NUMBER OF REPEATERS 13		REPEATER SPACING 7 nm
REPEATER MANUFACTURER Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH 5704+5704 kHz	TRANSMISSION FREQUENCIES 312-6016+7996-13700 kHz			
NUMBER OF EQUALIZERS none	EQUALIZATION METHOD -			
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 1260 now 1260		CHANNEL SPACING, INITIAL 4kHz now 4 kHz		
TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd.		CONSTRUCTION CONTRACTOR STC		
POWER FEED MODE double end	NOMINAL VOLTAGE 200/200	SYSTEM CURRENT 0.495 A		
TASI TYPE - CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -	

COST	$ MILLION
CABLE	0.85
SUBMERGED ELECTRONICS	0.50
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	-
INSTALLATION	0.10
TOTAL	1.70
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **128**

OFFICIAL NAME	Broadstairs-Oostende		
OTHER NAMES	Broadstairs- Oostende A(1)	U. K. - Belgium 3	Joss Bay-Middelkerke
COUNTRY A	England	COUNTRY B	Belgium
TERMINUS A	Broadstairs, Kent	TERMINUS B	Oostende
LANDING POINT A	Joss Bay	LANDING POINT B	Middelkerke
COORDINATES A	51°23' N x 1°27' E	COORDINATES B	51°11' N x 2°48' E

OWNER A	British Post Office	CIRCUITS HELD	390 h
OWNER B	Régie des Télégraphes et des Téléphones	CIRCUITS HELD	390 h
I R U HOLDERS	DBP	Luxembourg	
CIRCUITS HELD	360	60	
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	64	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	10	REPEATER SPACING	7 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz
TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	–
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1260 now 1260
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	120/120
SYSTEM CURRENT	0.495 A

TASI TYPE	–	CIRCUITS USED	–	CIRCUITS DERIVED	–	TOTAL CIRCUITS	–	DATE APPLIED	–

COST	$ MILLION
CABLE	0.65
SUBMERGED ELECTRONICS	0.50
TERMINAL AND POWER FEED	0.25
TERMINAL STATIONS	0.03
INSTALLATION	0.10
TOTAL	1.53
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **129**

OFFICIAL NAME	Marseilles - Bordj El Kiffan		
OTHER NAMES	Marseille-Algiers No. 2		
COUNTRY A	France	COUNTRY B	Algeria
TERMINUS A	Marseille	TERMINUS B	Bordj El Kiffan
LANDING POINT A	La Seyne	LANDING POINT B	Bordj El Kiffan
COORDINATES A	43°06' N x 5°54' E	COORDINATES B	36°53' N x 3°2' E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	444h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	480h
I R U HOLDERS	DBP		
CIRCUITS HELD	36		
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	444	SINGLE OR TWIN	single	SYSTEM TYPE	S 5

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	MARCEL BAYARD

REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized	NUMBER OF REPEATERS	53	REPEATER SPACING	8 nm

REPEATER MANUFACTURER: Compagnie Industrielle de Télecomunication

NOMINAL TRANSMISSION BANDWIDTH: 1980+1980 kHz — TRANSMISSION FREQUENCIES: 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS: 4 — EQUALIZATION METHOD: computed and assembled on board

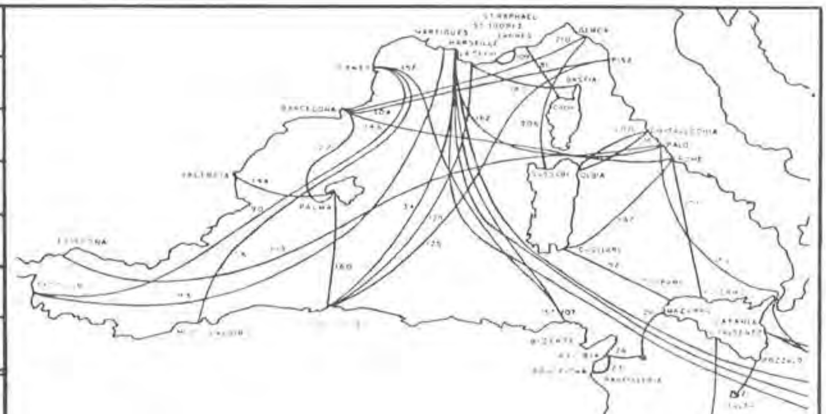
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 480 — now 480 — CHANNEL SPACING, INITIAL: 4 kHz — now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: Cie. Industrielle de Télécomunication — CONSTRUCTION CONTRACTOR: CIT

POWER FEED MODE: double end — NOMINAL VOLTAGE: 800/800 — SYSTEM CURRENT: 0.180 A

TASI TYPE: – CIRCUITS USED: – CIRCUITS DERIVED: – TOTAL CIRCUITS: – DATE APPLIED: –

COST	$ MILLION
CABLE	3.45
SUBMERGED ELECTRONICS	3.82
TERMINAL AND POWER FEED	0.47
TERMINAL STATIONS	0.43
INSTALLATION	0.16
TOTAL	8.33
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

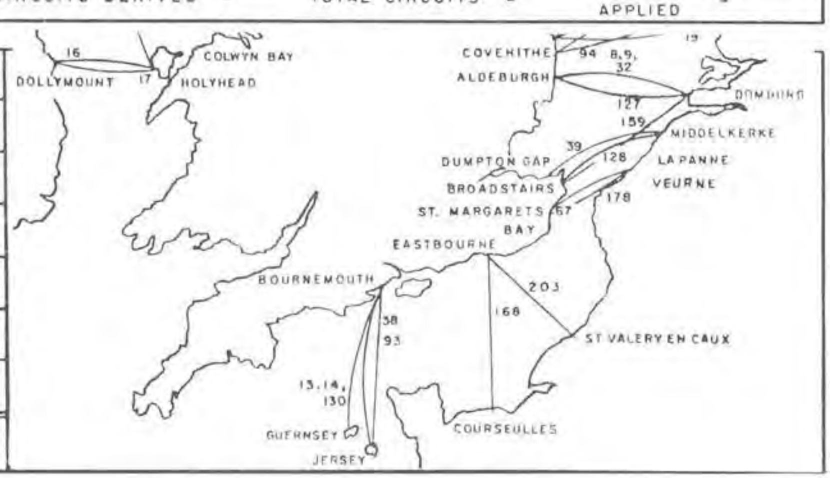
SYSTEM REFERENCE NUMBER **130**

OFFICIAL NAME	St. Peter Port-Tuckton Bridge A		
OTHER NAMES	Tuckton Bridge-Lancress Bay		
COUNTRY A	England	COUNTRY B	Guernsey, Channel Islands
TERMINUS A	Tuckton Bridge, Dorset	TERMINUS B	St. Peter Port
LANDING POINT A	Southbourne	LANDING POINT B	l'Ancress Bay
COORDINATES A	$50^{o}42'$ N x $1^{o}48'$ W	COORDINATES B	$49^{o}30'$ N x $2^{o}32'$ W

OWNER A	British Post Office	CIRCUITS HELD	1380 h
OWNER B	Channel Islands Telecommunications Administrations	CIRCUITS HELD	1380 h
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	89	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.47" 37.3 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIP USED:	ALERT (4)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized					NUMBER OF REPEATERS	14	REPEATER SPACING	7 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz					TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz		
NUMBER OF EQUALIZERS	none			EQUALIZATION METHOD	–				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380	now	1380	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.					CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	150/150			SYSTEM CURRENT	0.495 A		
TASI TYPE	–	CIRCUITS USED	–	CIRCUITS DERIVED	–	TOTAL CIRCUITS	–	DATE APPLIED	–

COST	$ MILLION
CABLE	2.00
SUBMERGED ELECTRONICS	1.25
TERMINAL AND POWER FEED	0.50
TERMINAL STATIONS	0.25
INSTALLATION	0.13
TOTAL	4.13
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

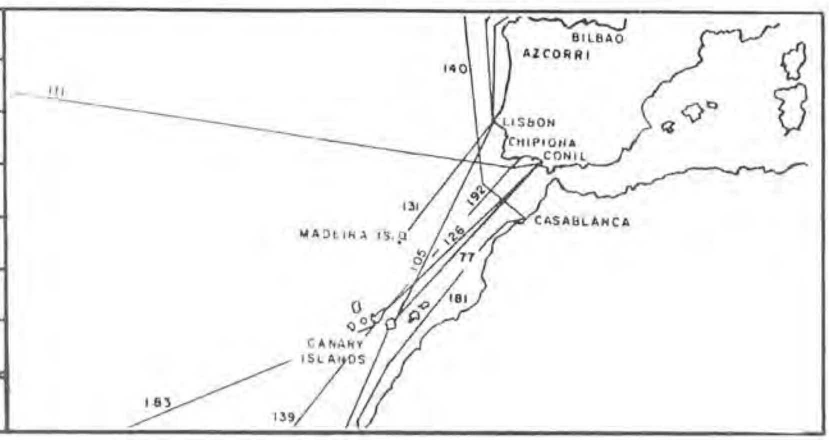
SYSTEM REFERENCE NUMBER **131**

OFFICIAL NAME	Lisboa - Funchal		
OTHER NAMES	Lisboa - Madeira Sesimbra - Funchal CAM 1		
COUNTRY A	Portugal (mainland)	COUNTRY B	Portugal (Madeira)
TERMINUS A	Sesimbra, Estremadura	TERMINUS B	Funchal
LANDING POINT A	Sesimbra	LANDING POINT B	Funchal
COORDINATES A	$38^{o}26'N \times 9^{o}6'W$	COORDINATES B	$32^{o}40'N \times 16^{o}48'W$

OWNER	Companhia Portuguesa Rádio Marconi	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	616	SINGLE OR TWIN	single	SYSTEM TYPE	U Mk I
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.1 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIP USED:	JOHN W MACKAY		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional					NUMBER OF REPEATERS	35	REPEATER SPACING	18 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz			TRANSMISSION FREQUENCIES	60-552+672-1164 kHz				
NUMBER OF EQUALIZERS	2			EQUALIZATION METHOD	adjusted on board				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160	now	120	CHANNEL SPACING, INITIAL	3 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.					CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1850/1850			SYSTEM CURRENT	0.415 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	2.1
SUBMERGED ELECTRONICS	1.6
TERMINAL AND POWER FEED	0.4
TERMINAL STATIONS	0.8
INSTALLATION	0.3
TOTAL	5.2
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **132**

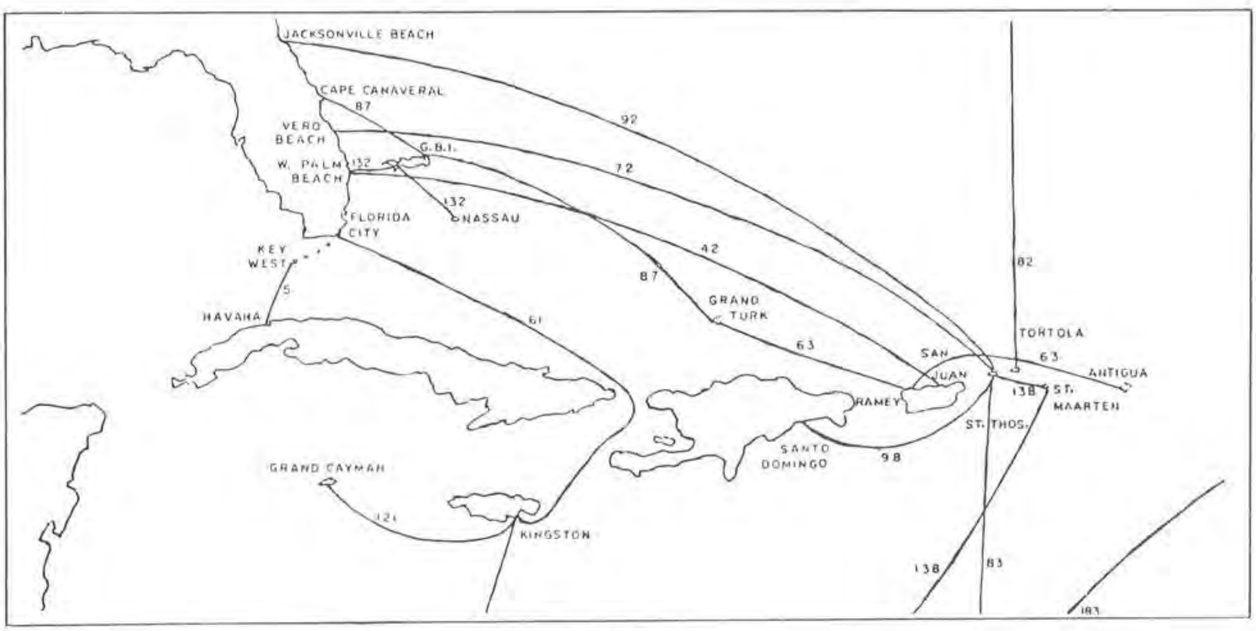
OFFICIAL NAME	Florida-Bahamas
OTHER NAMES	West Palm Beach-Eight Mile Rock-Nassau

COUNTRY A	Bahama Islands	COUNTRY B	Bahama Islands
TERMINUS A	Nassau, New Providence	TERMINUS B	Eight Mile Rock, Grand Bahama Is.
LANDING POINT A	Goodman Bay	LANDING POINT B	Brandie Pt.
COORDINATES A	$25^{o}4'$ N x $77^{o}23'$ W	COORDINATES B	$26^{o}32'$ N x $78^{o}49'$ W

COUNTRY C	U.S.A.	COUNTRY D	
TERMINUS C	West Palm Beach, Florida	TERMINUS D	
LANDING POINT C	Palm Beach	LANDING POINT D	
COORDINATES C	$26^{o}43'$ N x $80^{o}2'$ W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 149	BC 73					
DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



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continued

OWNERS	American Telephone & Telegraph Company and Bahamas Telecommunications Corp.
CIRCUITS HELD	AB: ATT/BTC 943 BTC 420 BC: ATT/BTC 1360
I R U HOLDERS	AB: ITTWC/BTC TRTT/BTC BC: ITTWC/BTC TRTT/BTC RCAGC/BTC
CIRCUITS HELD	6 9 8 10 2

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized — REPEATER SPACING 6.6 nm
NUMBER OF REPEATERS	AB 23 BC 11
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	AB 1 BC none
EQUALIZATION METHOD	assembled on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	AC double end
NOMINAL VOLTAGE	570/570 — SYSTEM CURRENT 0.495 A
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz — TRANSMISSION FREQUENCIES 312-6016+7996-13700 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380 now 1380 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	A Stations: AB-Nassau BC-Eight Mile Rock — CABLESHIP USED: ALERT (4)

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited

COST	$ MILLION
CABLE	2.5
SUBMERGED ELECTRONICS	2.1
TERMINAL AND POWER FEED	3.2
TERMINAL STATIONS	0.9
INSTALLATION	0.5
TOTAL	9.2
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **133** A

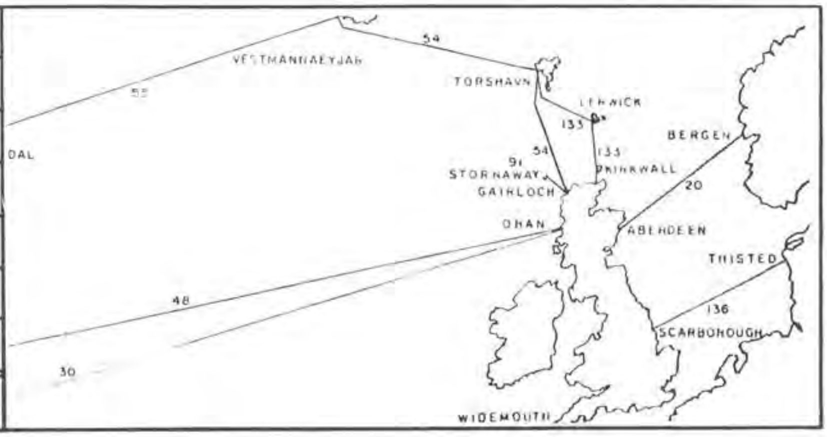
OFFICIAL NAME	Orkney-Shetlands		
OTHER NAMES	Kirkwall-Lerwick		
COUNTRY A	United Kingdom (Orkney Is.)	COUNTRY B	United Kingdom (Shetland Is.)
TERMINUS A	Kirkwall	TERMINUS B	Lerwick
LANDING POINT A	Yinstay Bay	LANDING POINT B	Voe of Sound
COORDINATES A	58°59' N x 2°49' W	COORDINATES B	60°07'N x 1°10' W

OWNER	British Post Office	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1971	NATURE OF SERVICE	commercial	CABLE MILES	108	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5M)

CABLE DESCRIPTION	armored polyethylene coaxial
CABLE SIZE	0.935" 23.7 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited
CABLESHIP USED:	ALERT (4)
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized
NUMBER OF REPEATERS	14
REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz
TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480 now 480
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	STC
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	300/300
SYSTEM CURRENT	0.118
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	0.77
SUBMERGED ELECTRONICS	0.73
TERMINAL AND POWER FEED	0.46
TERMINAL STATIONS	0.42
INSTALLATION	0.13
TOTAL	2.51
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

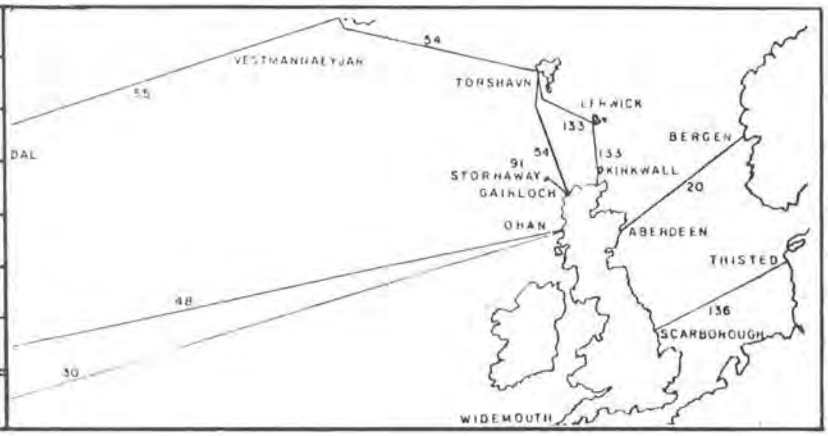
SYSTEM REFERENCE NUMBER **133** B

OFFICIAL NAME	Lerwick-Torshavn	ACRONYM	SHEFA
OTHER NAMES	Shetlands-Faeroes		
COUNTRY A	United Kingdom (Shetland Is.)	COUNTRY B	Denmark (Faroe Is.)
TERMINUS A	Lerwick	TERMINUS B	Torshavn
LANDING POINT A	Westerquarff	LANDING POINT B	Hvidanes
COORDINATES A	$60^{o}6'$ N x $1^{o}16'$ W	COORDINATES B	$62^{o}3'$ N x $6^{o}46'$ W

OWNER A	British Post Office	CIRCUITS HELD	480 h
OWNER B	General Directorate of Posts and Telegraphs	CIRCUITS HELD	480 h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	235	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5M)
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.47" 37.3mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited			CABLESHIP USED:	JOHN W MACKAY				
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized					NUMBER OF REPEATERS	27	REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz			TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz				
NUMBER OF EQUALIZERS	1			EQUALIZATION METHOD	assembled on board				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480		CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz			
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.			CONSTRUCTION CONTRACTOR	STC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	370/370	SYSTEM CURRENT	0.118 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.10
SUBMERGED ELECTRONICS	1.30
TERMINAL AND POWER FEED	0.12
TERMINAL STATIONS	-
INSTALLATION	0.28
TOTAL	2.80
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **134**

OFFICIAL NAME	Catanzaro-Alexandria		
OTHER NAMES			
COUNTRY A	Italy	COUNTRY B	Egypt
TERMINUS A	Catanzaro	TERMINUS B	Alexandria
LANDING POINT A	Marina di Catanzaro	LANDING POINT B	Alexandria
COORDINATES A	38°54' N x 16°38' E	COORDINATES B	31°11' N x 29°52' E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	425h
OWNER B	Telecommunications Organization	CIRCUITS HELD	480h
I R U HOLDERS	DBP	ATT	
CIRCUITS HELD	12	13	
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1972	NATURE OF SERVICE	commercial	CABLE MILES	890	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	85	REPEATER SPACING	11 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 6 EQUALIZATION METHOD adjusted on board

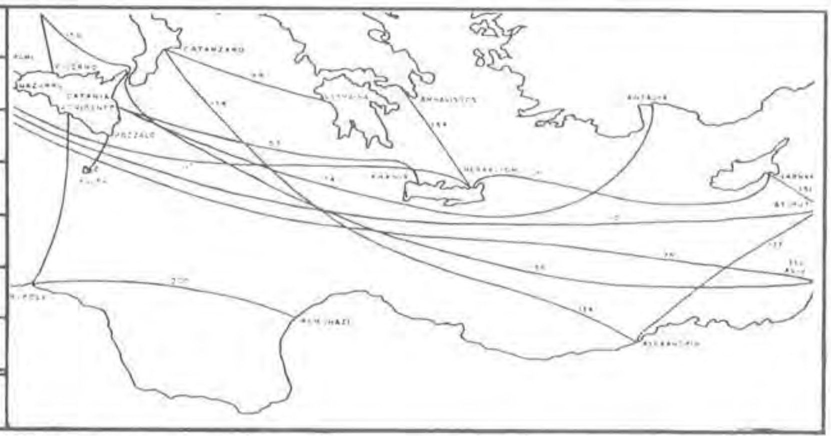
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end NOMINAL VOLTAGE 1000/1000 SYSTEM CURRENT 0.150 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	9.08
SUBMERGED ELECTRONICS	5.16
TERMINAL AND POWER FEED	0.52
TERMINAL STATIONS	0.43
INSTALLATION	0.58
TOTAL	15.77
SYSTEM DESIGN LIFE	20 years



RELOCATED 1974

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **135**

OFFICIAL NAME	Sagami Bay 2		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Miura	TERMINUS B	Ninomiya
LANDING POINT A	Nahama	LANDING POINT B	Ninomiya
COORDINATES A	35°9' N x 139°40' E	COORDINATES B	35°17'N x 139°16'E

OWNER	Kokusai Denshin Denwa Co. Ltd.	CIRCUITS HELD	all
	Relocated in 1974 as No. 148 and transferred to NTTPC		

DATE IN SERVICE	1972	NATURE OF SERVICE	experimental	CABLE MILES	65	SINGLE OR TWIN	single	SYSTEM TYPE	CS 12 M

CABLE DESCRIPTION armored polyethylene coaxial — CABLE SIZE 1.5" 38.1 mm

CABLE MANUFACTURER Ocean Cable Company Limited — CABLESHIP USED: KDD MARU

REPEATER DESCRIPTION monocontainer flexible bidirectional transistorized — NUMBER OF REPEATERS 10 — REPEATER SPACING 6.5 nm

REPEATER MANUFACTURER Nippon Electric Co. Ltd. and Fujitsu Limited

NOMINAL TRANSMISSION BANDWIDTH 5032+5032 kHz — TRANSMISSION FREQUENCIES 564-5596+7356-12388 kHz

NUMBER OF EQUALIZERS none — EQUALIZATION METHOD -

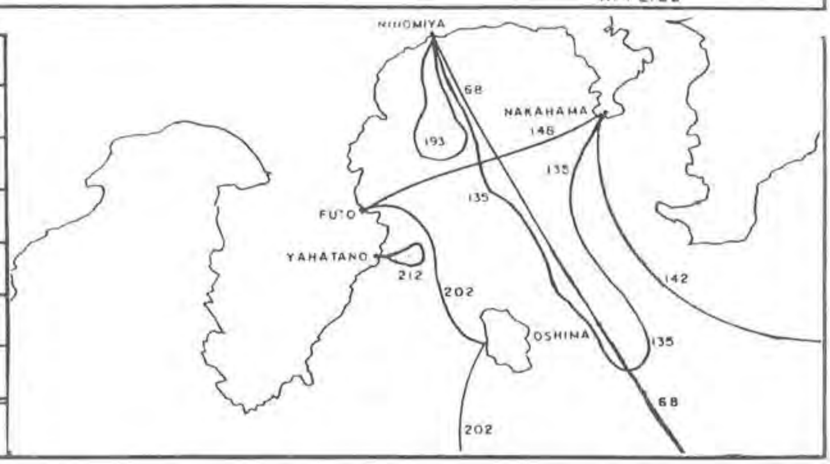
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 1200 now 1200 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Nippon Electric Co. Ltd. and Fujitsu Ltd. — CONSTRUCTION CONTRACTOR NTTPC

POWER FEED MODE double end — NOMINAL VOLTAGE 200/200 — SYSTEM CURRENT 0.100 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST * N. A.	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL * experimental system	
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **136**

OFFICIAL NAME	Scarborough-Thisted		
OTHER NAMES	Cayton Bay-Klitmøller	U.K. - Denmark 2	
COUNTRY A	England	COUNTRY B	Denmark
TERMINUS A	Scarborough, Yorkshire	TERMINUS B	Thisted, Thy
LANDING POINT A	Cayton Bay	LANDING POINT B	Klitmøller
COORDINATES A	54°15' N x 0°22' W	COORDINATES B	57°2' N x 8°28' E

OWNER A	British Post Office	CIRCUITS HELD	1260h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	300h
I R U HOLDERS	Finland	Norway	Sweden
CIRCUITS HELD	60h	300h	600h
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1973 | NATURE OF SERVICE commercial | CABLE MILES 381 | SINGLE OR TWIN single | SYSTEM TYPE NE (14M)

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 1.47" 37.3 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited | CABLESHIP USED: ALERT (4)

REPEATER DESCRIPTION monocontainer inflexible bidirectional transistorized | NUMBER OF REPEATERS 60 | REPEATER SPACING 7 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 5704+5704 kHz | TRANSMISSION FREQUENCIES 312-6016+7996-13700 kHz

NUMBER OF EQUALIZERS 3 | EQUALIZATION METHOD computed and assembled on board

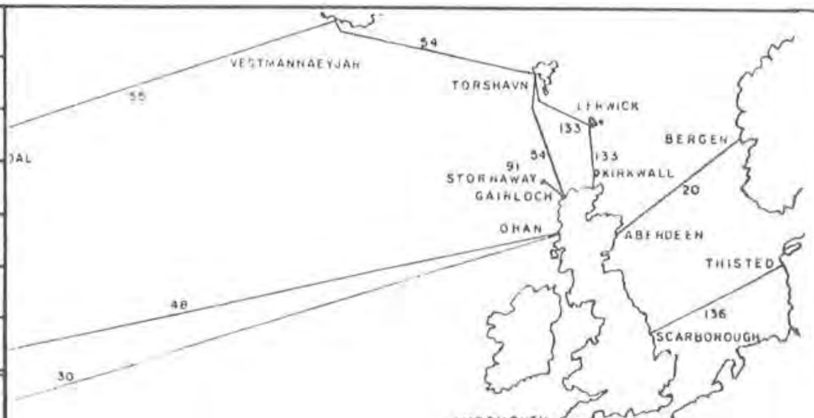
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 1260 now 1260 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. | CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end | NOMINAL VOLTAGE 800/800 | SYSTEM CURRENT 0.495 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	4.2
SUBMERGED ELECTRONICS	3.5
TERMINAL AND POWER FEED	0.5
TERMINAL STATIONS	0.4
INSTALLATION	0.2
TOTAL	8.8
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **137**

OFFICIAL NAME	Alexandria-Beirut		
OTHER NAMES			
COUNTRY A	Egypt	COUNTRY B	Lebanon
TERMINUS A	Alexandria	TERMINUS B	Beirut
LANDING POINT A	Alexandria	LANDING POINT B	Beirut
COORDINATES A	$31^{\circ}11'$ N x $29^{\circ}52'$ E	COORDINATES B	$33^{\circ}54'$ N x $35^{\circ}30'$ E

OWNER A	Telecommunications Organization	CIRCUITS HELD	120h
OWNER B	Administration of PTT SODETEL	CIRCUITS HELD	120h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1972 | NATURE OF SERVICE commercial | CABLE MILES 375 | SINGLE OR TWIN single | SYSTEM TYPE S 1

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.00" 25.4 mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIP USED: MARCEL BAYARD

REPEATER DESCRIPTION monocontainer flexible bidirectional | NUMBER OF REPEATERS 20 | REPEATER SPACING 17 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications

NOMINAL TRANSMISSION BANDWIDTH 492+492 kHz | TRANSMISSION FREQUENCIES 60-552+672-1164 kHz

NUMBER OF EQUALIZERS 1 | EQUALIZATION METHOD adjusted on board

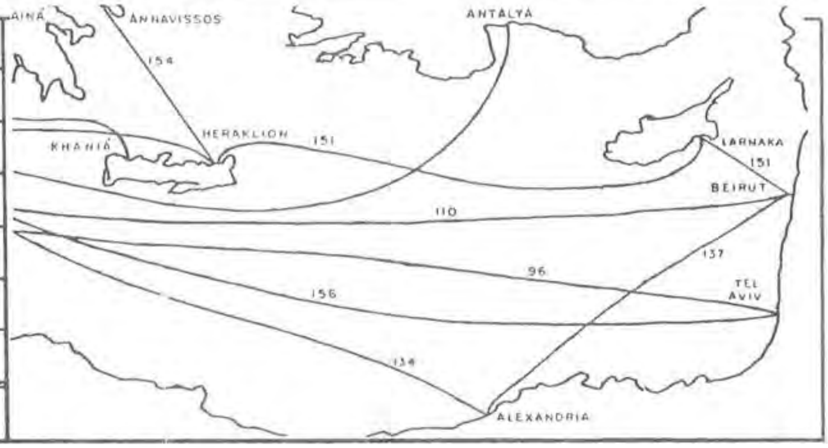
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 now 120 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Compagnie Industrielle de Télécomm. | CONSTRUCTION CONTRACTOR CIT

POWER FEED MODE double end | NOMINAL VOLTAGE 1300/1300 | SYSTEM CURRENT 0.090 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	4.50
SUBMERGED ELECTRONICS	1.98
TERMINAL AND POWER FEED	0.45
TERMINAL STATIONS	0.42
INSTALLATION	0.18
TOTAL	7.53
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **138**

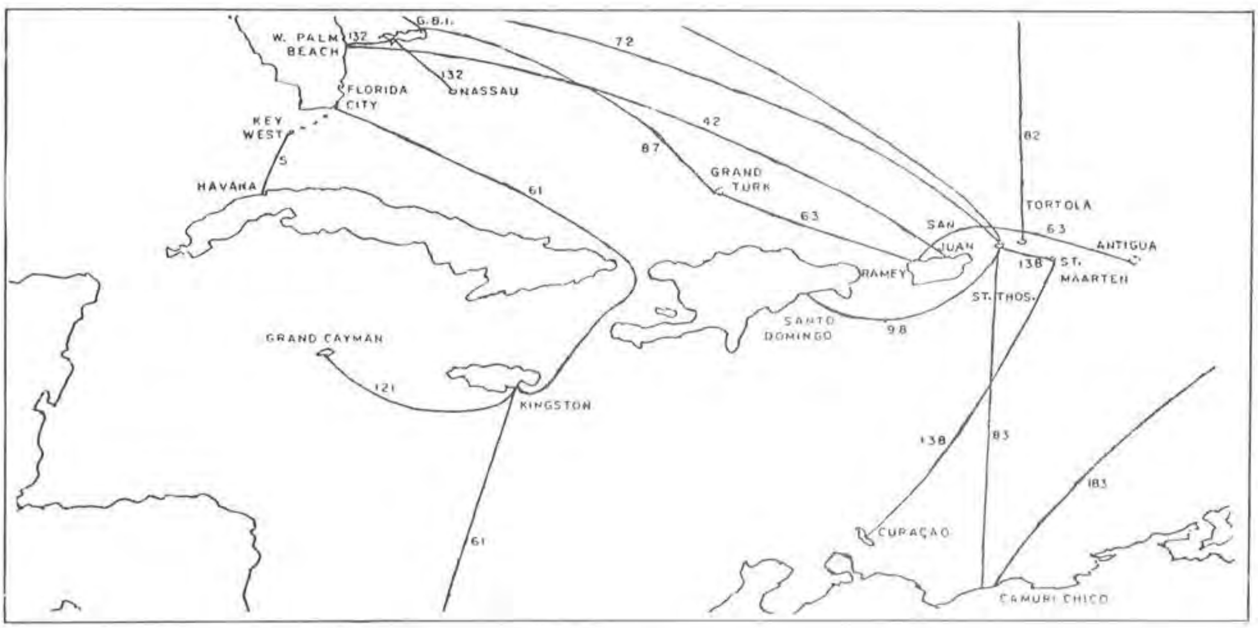
OFFICIAL NAME	St. Thomas-St. Maarten-Curaçao
OTHER NAMES	Netherlands Antilles Cable

COUNTRY A	U.S.A. (Virgin Islands)	COUNTRY B	Netherlands Antilles
TERMINUS A	Magens Bay	TERMINUS B	Sint Maarten
LANDING POINT A	Magens Bay	LANDING POINT B	Sint Maarten
COORDINATES A	18°22' N x 64°56' W	COORDINATES B	18°5' N x 63°7' W

COUNTRY C	Netherlands Antilles	COUNTRY D	
TERMINUS C	Willemstad, Curaçao	TERMINUS D	
LANDING POINT C	Willemstad	LANDING POINT D	
COORDINATES C	12°7' N x 68°55' W	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 129	BC 568					
DATE IN SERVICE	1973	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	U Mk I
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited						



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continued

OWNERS *	NAG	ITTCVI	AACR			
CIRCUITS HELD	275 h	27 h	18 h			
I R U HOLDERS	NAG with ITTCVI,	AACR,	RCAGC,	WUI,	ATT, NAG	
CIRCUITS HELD AB:	17	22	3	2	50	Remainder
BC:	8	12	3	2	66	Remainder
	NAG with Codetel	NPTT	FPTT			
AB:	6	0	2			
BC:	6	24	0			

REPEATER DESCRIPTION	monocontainer inflexible bidirectional — REPEATER SPACING 20 nm
NUMBER OF REPEATERS	A B 7 B C 27
REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NUMBER OF EQUALIZERS	A B none B C 1
EQUALIZATION METHOD	adjusted on board
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited
POWER FEED MODE	A B single end B C double end
NOMINAL VOLTAGE	1200 576/576 — SYSTEM CURRENT 0.210 A
NOMINAL TRANSMISSION BANDWIDTH	492 + 492 kHz — TRANSMISSION FREQUENCIES 60-552+672-1164 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160 now 160 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	CABLESHIP USED: JOHN W MACKAY

CONSTRUCTION CONTRACTOR	Standard Telephones & Cables Limited

COST	$ MILLION
CABLE	5.110
SUBMERGED ELECTRONICS	2.255
TERMINAL AND POWER FEED	0.540
TERMINAL STATIONS	0.440
INSTALLATION	0.390
TOTAL	8.735
SYSTEM DESIGN LIFE	20 years

*Netherlands Antilles Government, ITT Communications, Inc., Virgin Is., and All America Cables & Radio, Inc.

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **139**

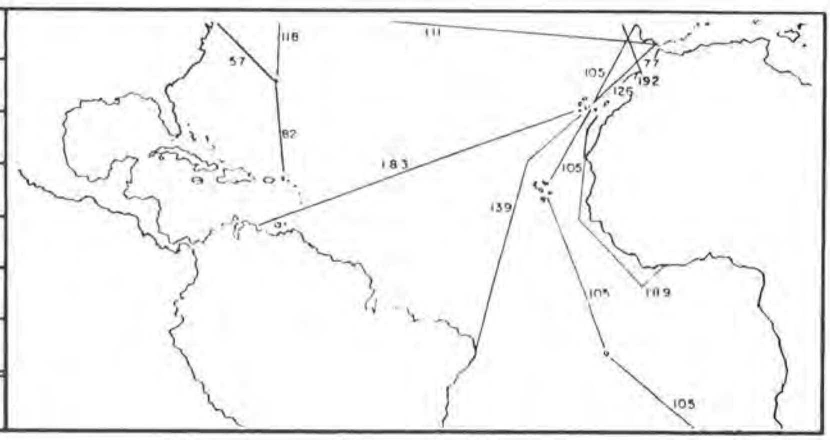
OFFICIAL NAME	Brazil-Canary Islands No. 1	ACRONYM	BRACAN 1
OTHER NAMES	Recife - Las Palmas		Brazil - Spain
COUNTRY A	Spain (Canary Islands)	COUNTRY B	Brazil
TERMINUS A	Agüimes, Gran Canary Is.	TERMINUS B	Recife, Pernambuco
LANDING POINT A	Arinaga Beach	LANDING POINT B	Boa Viagem Beach
COORDINATES A	$27^{o}51'$ N x $15^{o}24'$W	COORDINATES B	$8^{o}8'$ S x $34^{o}53'$ W

OWNER A	Cía. Telefónica Nacional de España	CIRCUITS HELD	32h
OWNER B	Emprêsa Brasileira de Telecomunicações	CIRCUITS HELD	160h
I R U HOLDERS	See opposite page		
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1973	NATURE OF SERVICE	commercial	CABLE MILES	2634	SINGLE OR TWIN	single	SYSTEM TYPE	NA (U Mk3

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS 137	REPEATER SPACING 19.8nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	492+492 kHz	TRANSMISSION FREQUENCIES	60-552+672-1164 kHz
NUMBER OF EQUALIZERS	11	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	160 now 160	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE 2400/2400	SYSTEM CURRENT 0.210 A
TASI TYPE - CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -

COST Estimated	$ MILLION
CABLE	13.2
SUBMERGED ELECTRONICS	8.2
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	1.2
INSTALLATION	0.9
TOTAL	24.4
SYSTEM DESIGN LIFE	25 years



ALLOCATIONS

EMBRATEL	with	(160)
	CTNE	32
	ITALCABLE	24
	Switzerland	18
	CPRM	16
	KDD	30
	DBP	16
	MPT France	18
	Radio Austria	1
	PTT Austria	5
	ATT	9
	RCAGC	2
	WUI	2
	ITTWC	1

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **140**

OFFICIAL NAME	Penmarch - Casablanca
OTHER NAMES	France - Morocco 2

COUNTRY A	France	COUNTRY B	Morocco
TERMINUS A	Penmarch	TERMINUS B	Casablanca
LANDING POINT A	Penmarch	LANDING POINT B	Casablanca
COORDINATES A	47°50'N x 04°21'W	COORDINATES B	33°51'N x 7°38'W

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	592h
OWNER B	Administration of P T T	CIRCUITS HELD	640h
I R U HOLDERS	DBP		
CIRCUITS HELD	48		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1973 | NATURE OF SERVICE commercial | CABLE MILES 1035 | SINGLE OR TWIN single | SYSTEM TYPE S 5

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.5" 38.1mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIP USED: MARCEL BAYARD

REPEATER DESCRIPTION Monocontainer flexible bidirectional transistorized | NUMBER OF REPEATERS 92 | REPEATER SPACING 12nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications CIT-ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 8 | EQUALIZATION METHOD Stepping switch

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 640 now 640 | CHANNEL SPACING, INITIAL 3 kHz now 3 kHz

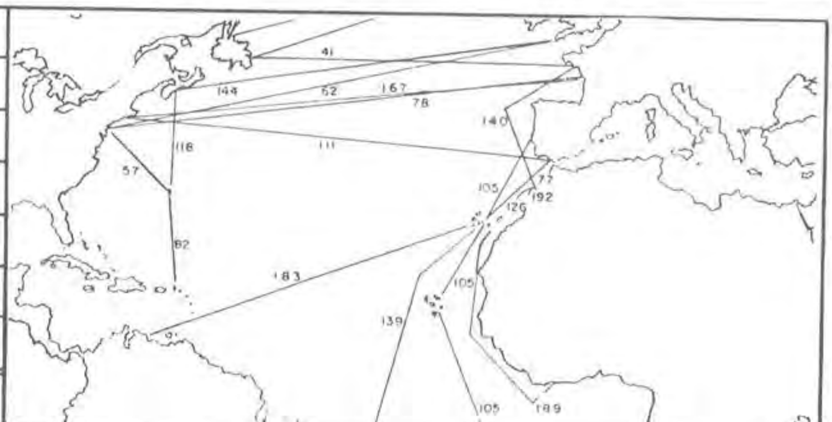
TERMINAL EQUIPMENT MANUFACTURER CIT-ALCATEL | CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE double end | NOMINAL VOLTAGE 1000/1000 | SYSTEM CURRENT 0.180 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	14.18
SUBMERGED ELECTRONICS	6.80
TERMINAL AND POWER FEED	0.48
TERMINAL STATIONS	0.44
INSTALLATION	0.28
TOTAL	22.18

SYSTEM DESIGN LIFE 25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **141**

OFFICIAL NAME	Aomori-Hakodate		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Yamazaki, Aomori	TERMINUS B	Kikonai, Hokkaido
LANDING POINT A	Yamazaki	LANDING POINT B	Kikonai
COORDINATES A	40°47' N x 140°44' E	COORDINATES B	41°48' N x 140°49' E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1973	NATURE OF SERVICE	commercial	CABLE MILES	30	SINGLE OR TWIN	single	SYSTEM TYPE	CS36MS

CABLE DESCRIPTION	armored polyethylene coaxial — CABLE SIZE 1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Limited — CABLESHIP USED: TSUGARU MARU
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized — NUMBER OF REPEATERS 15 — REPEATER SPACING 2 nm
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.
NOMINAL TRANSMISSION BANDWIDTH	12672+12672kHz — TRANSMISSION FREQUENCIES 4332-17004+22796-35468kHz
NUMBER OF EQUALIZERS	none — EQUALIZATION METHOD -
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700 now 2700 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Nippon Electric Co. Ltd. and Fujitsu Limited — CONSTRUCTION CONTRACTOR NTTPC
POWER FEED MODE	double end — NOMINAL VOLTAGE 200/200 — SYSTEM CURRENT 0.156 A
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST *N.A.	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL * prototype installation	
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **142**

OFFICIAL NAME	Miura-Ibaraki		
OTHER NAMES	Tokyo By-Pass		
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Miura, Kanagawa	TERMINUS B	Ajigaura, Ibaraki
LANDING POINT A	Nahama	LANDING POINT B	Ajigaura
COORDINATES A	$35^{\circ}09'$N x $139^{\circ}40'$ E	COORDINATES B	$36^{\circ}20'$ N x $140^{\circ}35'$ E

OWNER	Nippon Telephone & Telegraph Public Corporation	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD			
LESSEES	none		
CIRCUITS LEASED			

DATE IN SERVICE	1973	NATURE OF SERVICE	commercial	CABLE MILES	244	SINGLE OR TWIN	single	SYSTEM TYPE	CS36M
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.5" 38.1 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited					CABLESHIPS USED:	TSUGARU MARU KDD MARU		
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized			NUMBER OF REPEATERS	84	REPEATER SPACING	3.1 nm		
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35468kHz						
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	magnetic adjustment						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	now	2700	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu			CONSTRUCTION CONTRACTOR	NTTPC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	800/800	SYSTEM CURRENT	0.156 A				
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -		TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	3.3
SUBMERGED ELECTRONICS	4.9
TERMINAL AND POWER FEED	0.6
TERMINAL STATIONS	0.5
INSTALLATION	0.2
TOTAL	9.5
SYSTEM DESIGN LIFE	20 years

143 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **144**

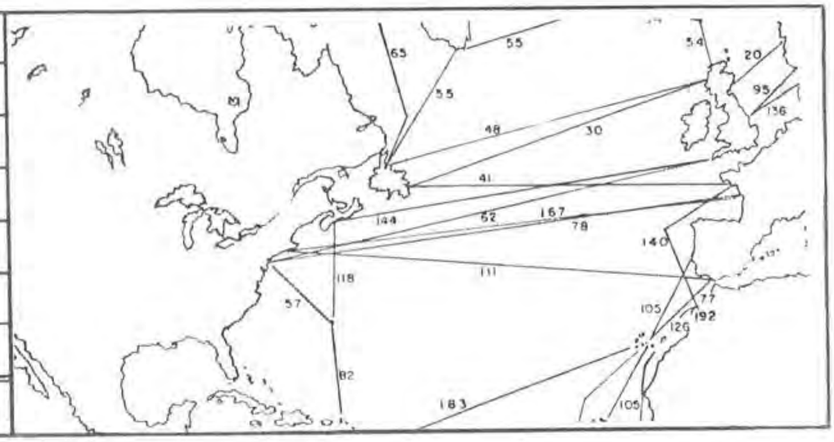
OFFICIAL NAME	Widemouth-Halifax	ACRONYM	CANTAT 2
OTHER NAMES	Canada Transatlantic No. 2		
COUNTRY A	England	COUNTRY B	Canada
TERMINUS A	Widemouth, Cornwall	TERMINUS B	Halifax, Nova Scotia
LANDING POINT A	Widemouth Bay	LANDING POINT B	Beaver Harbor
COORDINATES A	$50^{\circ}47'N \times 4^{\circ}34'W$	COORDINATES B	$44^{\circ}54'N \times 62^{\circ}25'W$

OWNER A	British Post Office		CIRCUITS HELD	1840h
OWNER B	Canadian Overseas Telecommunications Corporation *		CIRCUITS HELD	1840h
I R U HOLDERS	DBP / TGC	ATT/BPO	RCAGC/BPO	WUI/BPO
CIRCUITS HELD	100	373	3	1
	* Now Teleglobe Canada (TGC)			

DATE IN SERVICE 1974	NATURE OF SERVICE commercial	CABLE MILES 2805	SINGLE OR TWIN single	SYSTEM TYPE NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial — CABLE SIZE 1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized — NUMBER OF REPEATERS 473 — REPEATER SPACING 6 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd. — CABLESHIPS USED: MERCURY ARIEL JOHN CABOT
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz — TRANSMISSION FREQUENCIES 312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	31 — EQUALIZATION METHOD computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1840 now 1840 — CHANNEL SPACING, INITIAL 3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR STC
POWER FEED MODE	double end — NOMINAL VOLTAGE 5000/5000 — SYSTEM CURRENT 0.490 A
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	34.5
SUBMERGED ELECTRONICS	30.0
TERMINAL AND POWER FEED	3.9
TERMINAL STATIONS	0.1
INSTALLATION	2.0
TOTAL	70.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **145**

OFFICIAL NAME	Hawaii No. 3	ACRONYM	HAW 3
OTHER NAMES			
COUNTRY A	U.S.A. (Hawaii)	COUNTRY B	U.S.A.
TERMINUS A	Makaha, Oahu	TERMINUS B	San Luis Obispo, California
LANDING POINT A	Makaha	LANDING POINT B	San Luis Obispo
COORDINATES A	21°29'N x 158°13 W	COORDINATES B	35°18'N x 120°53'W

OWNER A	American Telephone & Telegraph Company	CIRCUITS HELD	
OWNER B	Hawaiian Telephone Company	CIRCUITS HELD	
I R U HOLDERS*	see following page		
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1974 | NATURE OF SERVICE commercial | CABLE MILES 2379 | SINGLE OR TWIN single | SYSTEM TYPE SF

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.50" 38.1 mm

CABLE MANUFACTURER Ocean Cable Co. Ltd., Standard Telephones & Cables Ltd., ITT (San Diego)

REPEATER DESCRIPTION monocontainer flexible bidirectional transistorized | NUMBER OF REPEATERS 248 | REPEATER SPACING 10 nm

REPEATER MANUFACTURER Western Electric Company | CABLESHIP USED: LONG LINES

NOMINAL TRANSMISSION BANDWIDTH 2160+2160 kHz | TRANSMISSION FREQUENCIES 554-2920+3575-5894 kHz

NUMBER OF EQUALIZERS 12 | EQUALIZATION METHOD switched networks

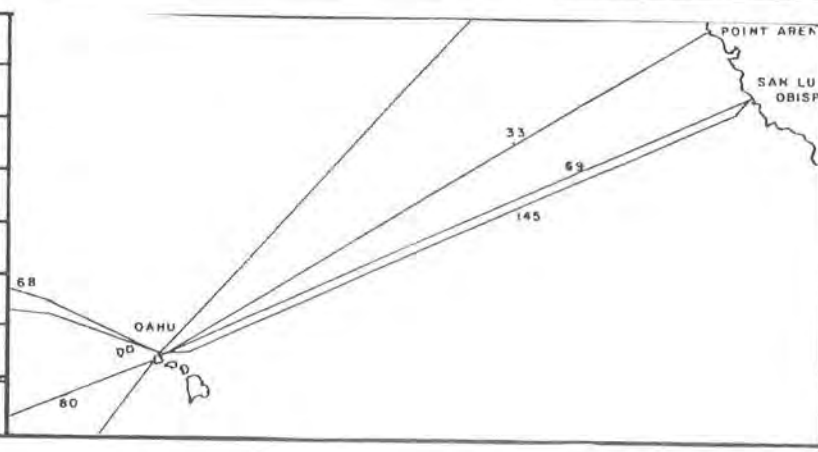
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 845 now 845 | CHANNEL SPACING, INITIAL 3 kHz now 3 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company | CONSTRUCTION CONTRACTOR ATT

POWER FEED MODE double end | NOMINAL VOLTAGE 1900/1900 | SYSTEM CURRENT 0.136 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	38.5
SUBMERGED ELECTRONICS	21.2
TERMINAL AND POWER FEED	7.2
TERMINAL STATIONS	0.8
INSTALLATION	1.0
TOTAL	69.6
SYSTEM DESIGN LIFE	24 years



ALLOCATIONS

	ATT	HTC	KDD	ITTWC	RCAGC	WUI	OTC(A)	POOL*
ATT	25	234	207		13			
PLDT	10							
ITA	12							
DPT	2							
SEACOM	4							
KDD			16	20	28	18		
ITTWC				29			2	
RCAGC					38		2	
WUI						39	2	
OTC(A)							42	
POOL*								115

*POOL: ATT, HTC, ITTWC, RCAGC, WUI

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **146**

OFFICIAL NAME	Barcelona-Rome	ACRONYM	BARO
OTHER NAMES	Spain - Italy 3		
COUNTRY A	Italy	COUNTRY B	Spain
TERMINUS A	Pomezia	TERMINUS B	Cabrera de Mar (Barcelona)
LANDING POINT A	Castelportziano	LANDING POINT B	Cabrera Beach
COORDINATES A	$41^{o}40'$ N x $12^{o}25'$ E	COORDINATES B	$41^{o}31'$ N x $2^{o}24'$ E

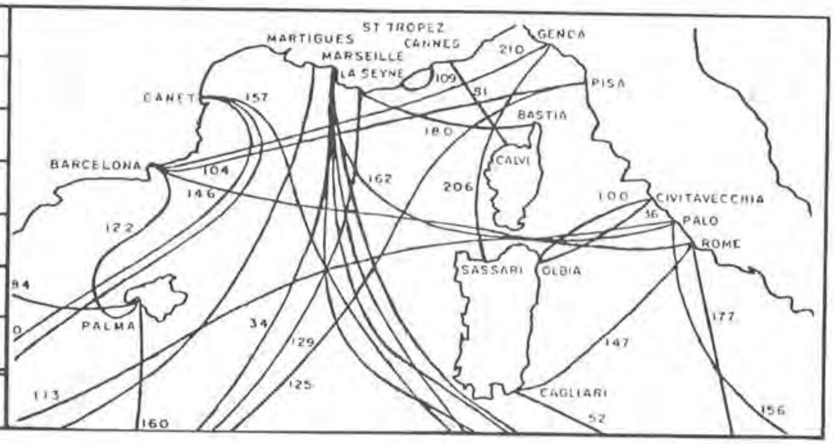
OWNER A	Azienda di Stato per i Servizi Telefonici	CIRCUITS HELD	1380h
OWNER B	Compania Telefonica Nacional de Espana	CIRCUITS HELD	1380h

I R U HOLDERS	DBP	BPO	TGC
CIRCUITS HELD	300	180	12
LESSEES	Various		
CIRCUITS LEASED	35		

DATE IN SERVICE	1974	NATURE OF SERVICE	commercial	CABLE MILES	513	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	82
REPEATER SPACING	6.5 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	5	EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380 now 1380	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE	1200/1200
SYSTEM CURRENT	0.490 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST Estimated	$ MILLION
CABLE	6.0
SUBMERGED ELECTRONICS	5.4
TERMINAL AND POWER FEED	2.7
TERMINAL STATIONS	0.6
INSTALLATION	1.0
TOTAL	15.7
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **147**

OFFICIAL NAME	Civitavecchia-Cagliari		
OTHER NAMES	Italy-Sardinia No. 3	Rome - Cagliari	
COUNTRY A	Italy	COUNTRY B	Italy
TERMINUS A	Civitavecchia	TERMINUS B	Cagliari, Sardinia
LANDING POINT A	Civitavecchia	LANDING POINT B	Cagliari
COORDINATES A	$42^{o}6'$ N x $11^{o}48'$ E	COORDINATES B	$39^{o}13'$ N x $9^{o}6'$ E

OWNER	Ministero delle Poste e delle Telecomunicazione	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1974	NATURE OF SERVICE	commercial	CABLE MILES	301	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	JOHN W MACKAY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional transistorized	NUMBER OF REPEATERS	48	REPEATER SPACING	7 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	computed and assembled on board

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380	now 1380	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	400/400	SYSTEM CURRENT	0.495 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	--

COST	$ MILLION
CABLE	3.54
SUBMERGED ELECTRONICS	2.62
TERMINAL AND POWER FEED	0.60
TERMINAL STATIONS	0.49
INSTALLATION	0.55
TOTAL	7.80
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **148**

OFFICIAL NAME	Miura - Itoh		
OTHER NAMES	(Relocation of No. 135)	Yokosuka - Itoh	Sagami Bay 2 Relocated
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Miura, Kanagawa	TERMINUS B	Futo, Shizuoka
LANDING POINT A	Nahama	LANDING POINT B	Futo
COORDINATES A	35°09'N x 139°40'E	COORDINATES B	34°55'N x 139°08'E

OWNER	Nippon Telegraph & Telephone Public Corporation	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE 1974 | NATURE OF SERVICE commercial | CABLE MILES 34 | SINGLE OR TWIN single | SYSTEM TYPE CS 12 M

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.5" 38.1mm

CABLE MANUFACTURER Ocean Cable Company Limited

REPEATER DESCRIPTION monoconatiner flexible bidirectional transistorized | NUMBER OF REPEATERS 5 | REPEATER SPACING 6.5 nm

REPEATER MANUFACTURER Nippon Electric Co. Ltd. and Fujitsu Ltd.

NOMINAL TRANSMISSION BANDWIDTH 5192+5192 kHz | TRANSMISSION FREQUENCIES 316-5508+7196-12388 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD -

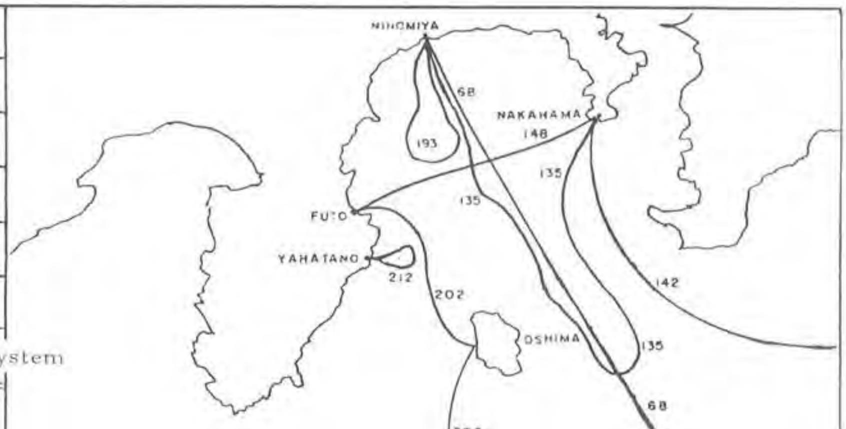
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 1200 now 1200 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER NEC and Fujitsu | CONSTRUCTION CONTRACTOR NTTPC

POWER FEED MODE single end | NOMINAL VOLTAGE 100 | SYSTEM CURRENT 0.100 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST not available*	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	*Originally an experimental system
SYSTEM DESIGN LIFE	20 years



149 restricted

SEACABLE SYSTEM DATA PROFILE

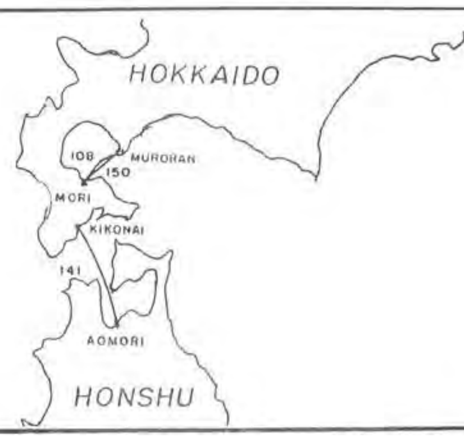
SYSTEM REFERENCE NUMBER **150**

OFFICIAL NAME	Mori-Muroran 2		
OTHER NAMES	Uchiura Bay 2		
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Mori, Hokkaido	TERMINUS B	Muroran, Hokkaido
LANDING POINT A	Mori	LANDING POINT B	Muroran
COORDINATES A	$42^{o}6'$ N x $140^{o}35'$ E	COORDINATES B	$42^{o}18'$ N x $141^{o}0'$E

OWNER	Nippon Telegraph & Telephone Public Corporation	CIRCUITS HELD	all
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1974	NATURE OF SERVICE	commercial	CABLE MILES	19	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36M
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited			CABLESHIP USED:	TSUGARU MARU				
REPEATER DESCRIPTION	monocontainer flexible bidirectional transistorized			NUMBER OF REPEATERS	10	REPEATER SPACING	2nm		
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672	TRANSMISSION FREQUENCIES	4332-17004+22796-35468kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	now	2700	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu			CONSTRUCTION CONTRACTOR	NTTPC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	200/200	SYSTEM CURRENT	0.156 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.48
SUBMERGED ELECTRONICS	0.62
TERMINAL AND POWER FEED	0.55
TERMINAL STATIONS	0.45
INSTALLATION	0.10
TOTAL	2.20
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **151**

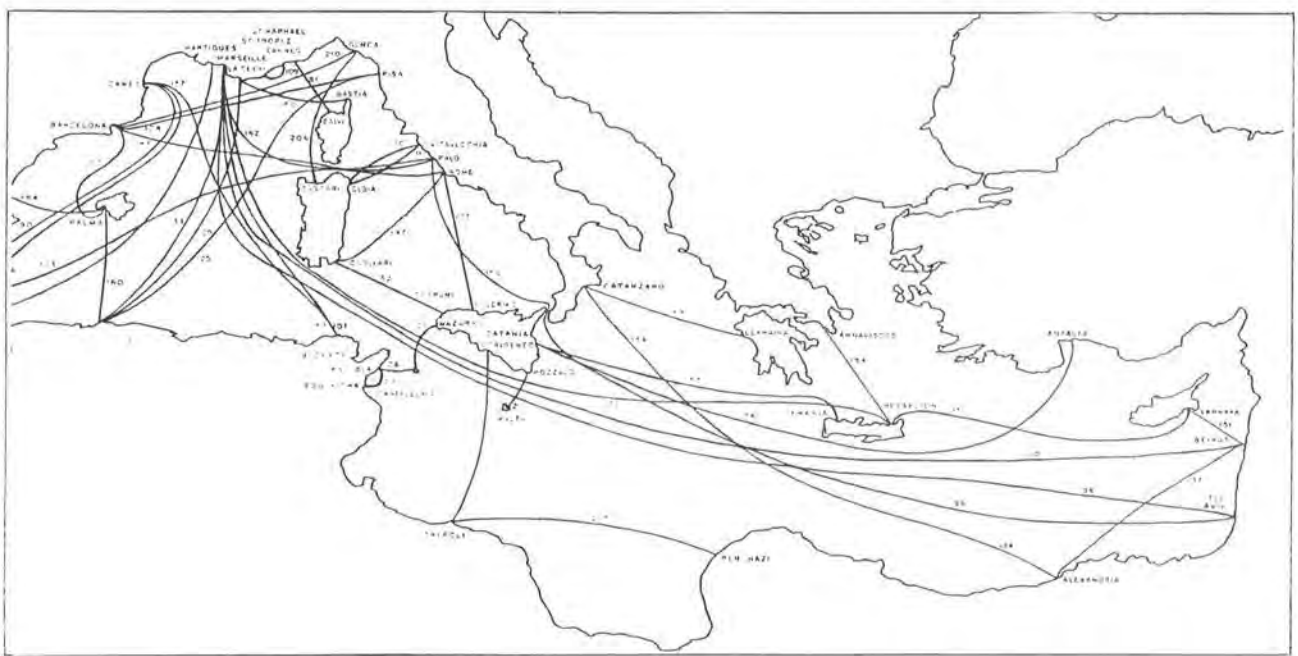
OFFICIAL NAME	France-Greece-Cyprus-Lebanon
OTHER NAMES	ARIANE APHRODITE ADONIS

COUNTRY A	France	COUNTRY B	Greece
TERMINUS A	Marseille	TERMINUS B	Heraklion, Crete
LANDING POINT A	Marseille	LANDING POINT B	Amnissos
COORDINATES A	$43^{\circ}16'$N x $05^{\circ}23'$ E	COORDINATES B	$35^{\circ}20'$N x $25^{\circ}12'$E

COUNTRY C	Cyprus	COUNTRY D	Lebanon
TERMINUS C	Larnaka	TERMINUS D	Beirut
LANDING POINT C	Larnaka	LANDING POINT D	Beirut
COORDINATES C	$34^{\circ}54'$N x $33^{\circ}38'$E	COORDINATES D	$33^{\circ}54'$N x $25^{\circ}12'$E

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 1343	B C 521	C D 117				
DATE IN SERVICE	ABC: 1974 CD: 1975	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	S 5
CABLE DESCRIPTION	unarmored polyethylene coaxial				CABLE SIZE	1.5"	38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon						



OWNERS*	AB: Helltelca S. A.	BC: OTE and CYTA	CD: SDTL + CYTA + OTE
CIRCUITS HELD	All	All	All
	See following page.		

REPEATER DESCRIPTION monocontainer flexible bidirectional transistorized — REPEATER SPACING 12 nm

NUMBER OF REPEATERS A B 123 B C 45 C D 10

REPEATER MANUFACTURER Cie. Industrielle de Télécommunication CIT - ALCATEL

NUMBER OF EQUALIZERS A B 9 B C 3 C D none

EQUALIZATION METHOD adjusted on board

TERMINAL EQUIPMENT MANUFACTURER CIT - ALCATEL

POWER FEED MODE A B double end B C double end C D double end

NOMINAL VOLTAGE 3000/3000 1100/1100 265/265 — SYSTEM CURRENT 0.180 A

NOMINAL TRANSMISSION BANDWIDTH 1980 + 1980 kHz — TRANSMISSION FREQUENCIES 312-2292 + 2792-4772 kHz

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz and 3 kHz

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - - TOTAL CIRCUITS - DATE APPLIED -

REMARKS CABLESHIP USED: MARCEL BAYARD

CONSTRUCTION CONTRACTOR SUBMARCOM

COST $ MILLION	AB	BC	CD
CABLE	12.10	4.62	1.10
SUBMERGED ELECTRONICS	8.50	3.15	0.69
TERMINAL AND POWER FEED	1.05	0.84	0.84
TERMINAL STATIONS	0.35	0.35	0.36
INSTALLATION	2.81	1.57	0.52
TOTAL	24.81	10.53	3.51

SYSTEM DESIGN LIFE 25 years

*Helltelca S. A. is a joint enterprise of the governments of France and Greece.

OTE is the Hellenic Telecommunications Organization

CTA is the Cyprus Telecommunications Authority

SDTL is the Societé de Development des Telecommunications du Liban

IRU HOLDERS AB:

OTE	CYTA	Liban	France	BTI	Spain	Suisse	Netherlands	RCA	ITT	WUI	ATT	TGC
156*	48	96	139	80	24	36	16	5	4	2	5	7
240			137					4	3	3	80	29

IRU HOLDERS BC:

BTI	France	TGC	ITT	ATT	Italy	Austria	RCA	WUI	Radio Austria	Israel
20	101	7	4	6	12	12	5	2	1	12

* First number = 4 kHz-spaced circuits
Second number = 3 kHz-spaced circuits

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **152**

OFFICIAL NAME	St. Raphael-La Foux		
OTHER NAMES			
COUNTRY A	France	COUNTRY B	France
TERMINUS A	St. Raphael	TERMINUS B	La Foux
LANDING POINT A	St. Raphael	LANDING POINT B	La Foux
COORDINATES A	43°24'N x 06°48'E	COORDINATES B	43°16'N x 06°35'E

OWNER	Administration of Posts and Telecommunications	CIRCUITS HELD	All

DATE IN SERVICE	1975	NATURE OF SERVICE	experimental	CABLE MILES	19	SINGLE OR TWIN	single	SYSTEM TYPE	S25

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.50" 38.1mm

CABLE MANUFACTURER Les Câbles de Lyon — CABLESHIP USED: VERCORS

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state — NUMBER OF REPEATERS 5 — REPEATER SPACING 5 nm

REPEATER MANUFACTURER Cie. Industrielle de Télécommunications CIT - ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 10652+10652kHz — TRANSMISSION FREQUENCIES 812-11464+14576-25228 kHz

NUMBER OF EQUALIZERS 1 — EQUALIZATION METHOD remote controlled

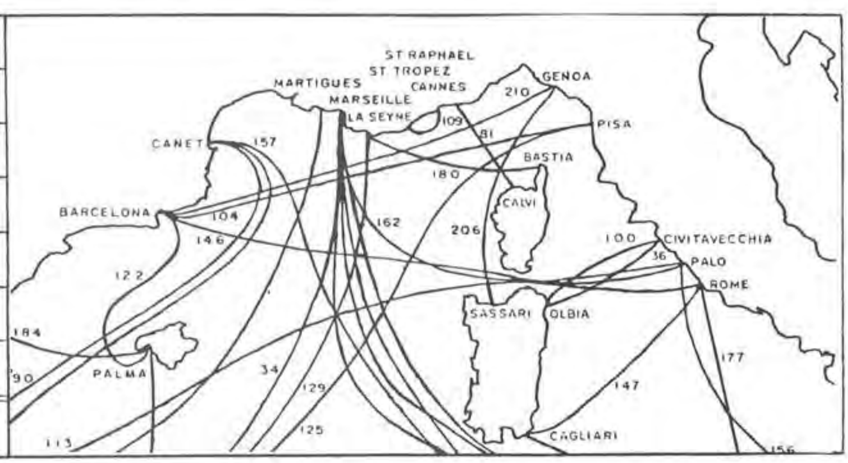
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 2340 now 2340 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT - ALCATEL — CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE double end — NOMINAL VOLTAGE 100/100 — SYSTEM CURRENT 0.365A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	0.38
SUBMERGED ELECTRONICS	0.50
TERMINAL AND POWER FEED	0.50
TERMINAL STATIONS	-
INSTALLATION	0.17
TOTAL	1.55
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **153**

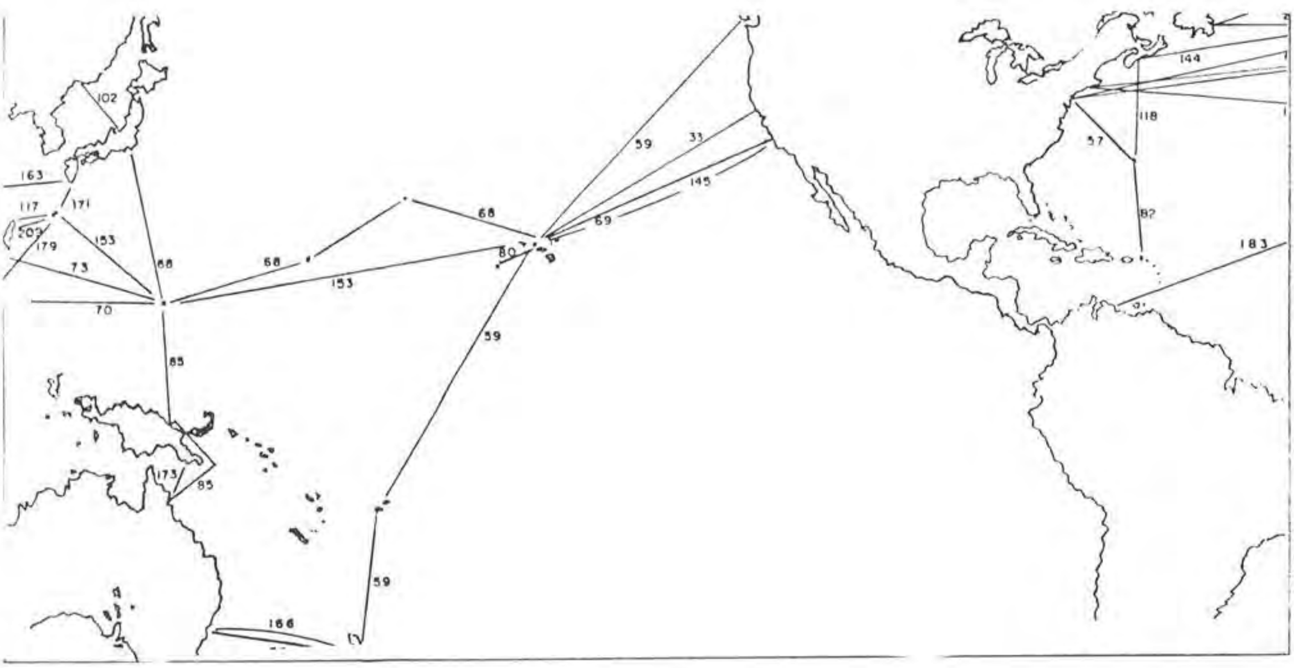
OFFICIAL NAME	TRANSPAC 2	ACRONYM	TPC 2
OTHER NAMES	United States-Japan Hawaii-Guam-Okinawa		

COUNTRY A	U. S. A.	COUNTRY B	U. S. A.
TERMINUS A	Makaha, Oahu, Hawaii	TERMINUS B	Agana, Guam
LANDING POINT A	Makaha	LANDING POINT B	Tanguisson Point
COORDINATES A	$21^{\circ}29'$N x $158^{\circ}13'$W	COORDINATES B	$13^{\circ}33'$N x $144^{\circ}48'$E

COUNTRY C	Japan	COUNTRY D	
TERMINUS C	Gushikami, Okinawa	TERMINUS D	
LANDING POINT C	Gushikami	LANDING POINT D	
COORDINATES C	$26^{\circ}07'$N x $127^{\circ}45'$E	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 3483	B C 1397					
DATE IN SERVICE	AB: 1975 BC: 1976	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	SF
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.5" 38.1mm
CABLE MANUFACTURER	ITT Cable/Hydrospace Div., Standard Telephones & Cables Ltd., Ocean Cable Co. Ltd.						



OWNERS	ATT, HTC, ITT, RCA, WUI, KDD, OTC(A)
CIRCUITS HELD	See following page
I R U HOLDERS	
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state	REPEATER SPACING 10 nm
NUMBER OF REPEATERS A B 381 B C 141	
REPEATER MANUFACTURER Western Electric Company	
NUMBER OF EQUALIZERS A B 18 B C 6	
EQUALIZATION METHOD switched networks	
TERMINAL EQUIPMENT MANUFACTURER Western Electric Company	
POWER FEED MODE A B double end B C double end	
NOMINAL VOLTAGE 2780/2780 1050/1050	SYSTEM CURRENT 0.136 A
NOMINAL TRANSMISSION BANDWIDTH 2160 + 2160 kHz	TRANSMISSION FREQUENCIES 554-2920+3575-5894 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 845 now 845	CHANNEL SPACING, INITIAL 3 kHz now 3kHz
TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS -	DATE APPLIED -
REMARKS CABLESHIPS USED: LONG LINES, KDD MARU	

CONSTRUCTION CONTRACTOR	ATT Long Lines Division

COST	$ MILLION
CABLE	86
SUBMERGED ELECTRONICS	30
TERMINAL AND POWER FEED	1
TERMINAL STATIONS	-
INSTALLATION	6
TOTAL	123
SYSTEM DESIGN LIFE 24 years	

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continued

ALLOCATIONS

	ATT	HTC	KDD	ITTWC	RCAGC	WUI	OTC(A)
ATT	128						
RCAGC	13	10	33		37		
OTC(A)	15	4		2	2	2	42
KDD	139	30					
PLDT	10						
ITA	12						
DPT	2						
ITTWC			24	43			
WUI			18			55	
HTC		10					
POOL*							

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **154**

OFFICIAL NAME			
OTHER NAMES	Heraklion-Lagonissi	Crete-Greece(mainland)	
COUNTRY A	Greece	COUNTRY B	Greece
TERMINUS A	Heraklion, Crete	TERMINUS B	Athens (Lagonissi)
LANDING POINT A	Amnissos	LANDING POINT B	Lagonissi
COORDINATES A	$35^{\circ}20'N \times 25^{\circ}12'E$	COORDINATES B	$37^{\circ}45'N \times 23^{\circ}55'E$

OWNER	Hellenic Telecommunications Organization OTE	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	184	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

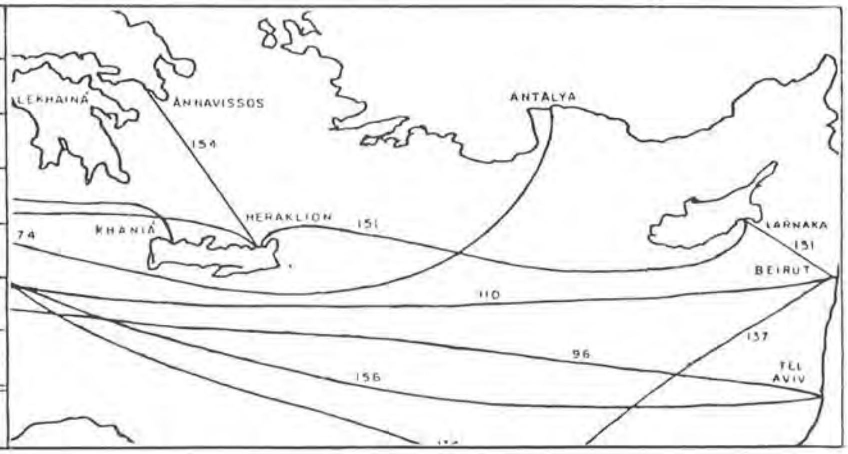
CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	JOHN W MACKAY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	28	REPEATER SPACING	6.5 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	5704 + 5704 kHz
TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	1
EQUALIZATION METHOD	computed and assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380 now 1380
CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	875/875
SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	5
SUBMERGED ELECTRONICS	3
TERMINAL AND POWER FEED	2
TERMINAL STATIONS	1
INSTALLATION	1
TOTAL	12
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **155**

OFFICIAL NAME	Germany-Sweden 2		
OTHER NAMES	G - S 2		
COUNTRY A	Federal Republic of Germany	COUNTRY B	Sweden
TERMINUS A	Burg, Fehmarn	TERMINUS B	Trelleborg
LANDING POINT A	Presen	LANDING POINT B	Trelleborg
COORDINATES A	$54^{\circ}29'$N x $11^{\circ}15'$E	COORDINATES B	$55^{\circ}23'$N x $13^{\circ}10'$E

OWNER A	Deutsche Bundespost	CIRCUITS HELD	1200h
OWNER B	Televerket	CIRCUITS HELD	1200h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	113	SINGLE OR TWIN	single	SYSTEM TYPE	KS 1200

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Limited	CABLESHIP USED:	SALERNUM

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state with temperature-actuated gain control (TAGC)	NUMBER OF REPEATERS	29	REPEATER SPACING	4.0 nm

REPEATER MANUFACTURER	Fujitsu Limited

NOMINAL TRANSMISSION BANDWIDTH	5248 + 5248	TRANSMISSION FREQUENCIES	316-5564+7804-13052 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	assembled on board

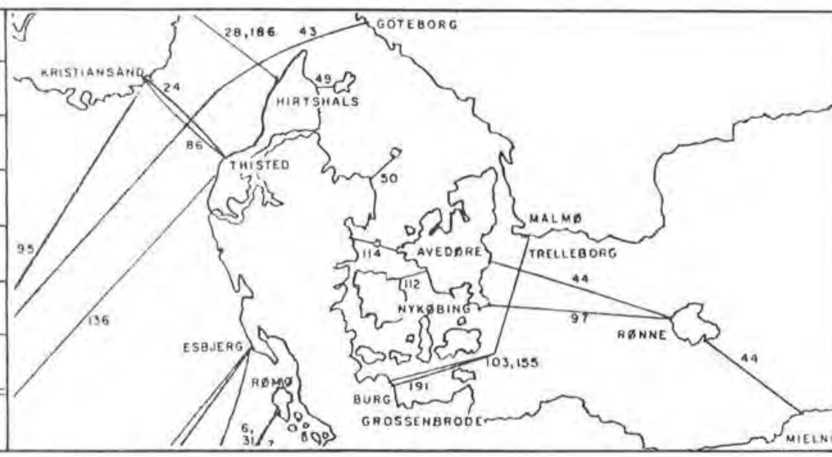
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1200	now 1200	CHANNEL SPACING,	INITIAL 4 khz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Limited	CONSTRUCTION CONTRACTOR	Fujitsu Ltd.

POWER FEED MODE	double end	NOMINAL VOLTAGE	270/270	SYSTEM CURRENT	0.150 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	2.6
SUBMERGED ELECTRONICS	1.0
TERMINAL AND POWER FEED	0.6
TERMINAL STATIONS	-
INSTALLATION	1.7
TOTAL	5.9
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **156**

OFFICIAL NAME	TELPAL	ACRONYM	TELPAL
OTHER NAMES	Tel Aviv-Palo		
COUNTRY A	Israel	COUNTRY B	Italy
TERMINUS A	Tel Aviv	TERMINUS B	Palo
LANDING POINT A	Tel Aviv	LANDING POINT B	Palo
COORDINATES A	32°04'N x 34°46'E	COORDINATES B	41°55'N x 12°07'E

OWNER	International Submarine Cable Company Limited	CIRCUITS HELD
	(a joint enterprise of the governments of Israel, Italy, and France)	
I R U HOLDERS	See following page	
CIRCUITS HELD		
LESSEES		
CIRCUITS LEASED		

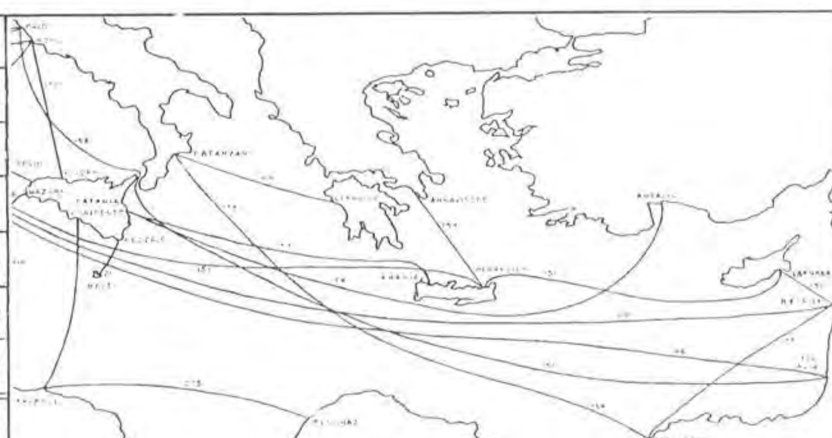
DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	1470	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.	CABLESHIPS USED:	ALERT (4) JOHN W MACKAY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional Solid-state	NUMBER OF REPEATERS	231	REPEATER SPACING	6.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	5704 + 5704 kHz	TRANSMISSION FREQUENCIES	312-6016 + 7996-13700 kHz		
NUMBER OF EQUALIZERS	15	EQUALIZATION METHOD	computed and assembled on board		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380	now 1380	CHANNEL SPACING, INITIAL 4 kHz	now 4 kHz	
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	3265/3265	SYSTEM CURRENT	0.490 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	12.0
SUBMERGED ELECTRONICS	15.6
TERMINAL AND POWER FEED	4.4
TERMINAL STATIONS	1.6
INSTALLATION	3.0
TOTAL	36.6
SYSTEM DESIGN LIFE	25 years



ALLOCATIONS

	Israel	Cyprus
ATT	300	
ITTWC	4	
RCAGC	4	
WUI	4	
DBP	240	
France	185	
ITALCABLE	182	
BPO	96	12
Belgium	48	
Austria	36	
Radio Austria	3	
TGC	36	
Netherlands	24	
Scandinavia	12	
CTNE	12	
OTE	12	
Israel, Western	12	
Turkey	2	

SEACABLE SYSTEM DATA PROFILE

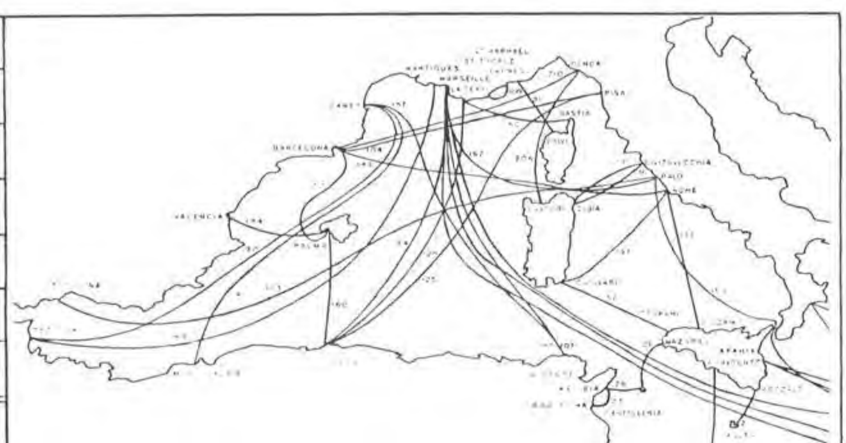
SYSTEM REFERENCE NUMBER **157**

OFFICIAL NAME	ANNIBAL		
OTHER NAMES	Perpignan-Bizerte	France - Tunisia 2	
COUNTRY A	France	COUNTRY B	Tunisia
TERMINUS A	Perpignan	TERMINUS B	Bizerte
LANDING POINT A	Canet Plage	LANDING POINT B	Bizerte
COORDINATES A	$42^{o}42'$N x $03^{o}00'$E	COORDINATES B	$37^{o}26'$N x $09^{o}49'$E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	640h
OWNER B	Administration of PTT	CIRCUITS HELD	640h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	509	SINGLE OR TWIN	single	SYSTEM TYPE	S 5
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.5" 38.1 mm		
CABLE MANUFACTURER	Les Càbles de Lyon					CABLESHIP USED:	VERCORS		
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	47	REPEATER SPACING	12 nm		
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT ALCATEL								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292 + 2792-4772 kHz						
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	640	now	640	CHANNEL SPACING, INITIAL	3 kHz	now	3 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Cie. Industrielle de Télécomm.			CONSTRUCTION CONTRACTOR	SUBMARCOM				
POWER FEED MODE	double end	NOMINAL VOLTAGE	1220/1220	SYSTEM CURRENT	0.180 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	7.6
SUBMERGED ELECTRONICS	2.3
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	0.2
INSTALLATION	1.1
TOTAL	12.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **158**

OFFICIAL NAME	U.K.-Spain No. 2	ACRONYM	UK - SP 2
OTHER NAMES	Sopelana - Goonhilly 3	England - Spain No. 2	
COUNTRY A	England	COUNTRY B	Spain
TERMINUS A	Goonhilly Downs, Cornwall	TERMINUS B	Azcorri, Vizcaya
LANDING POINT A	Kennack Sands	LANDING POINT B	Sopelana Beach
COORDINATES A	50°01'N x 5°08'W	COORDINATES B	43°23'N x 03°00'W

OWNER A	British Post Office	CIRCUITS HELD	1380h
OWNER B	Compañía Telefónica Nacional de España	CIRCUITS HELD	1380h
I R U HOLDERS	ASST	ITALCABLE	
CIRCUITS HELD	180	12	
LESSEES	Various		
CIRCUITS LEASED	2		

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	465	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	73	REPEATER SPACING	6.5 nm

REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	computed and adjusted on board

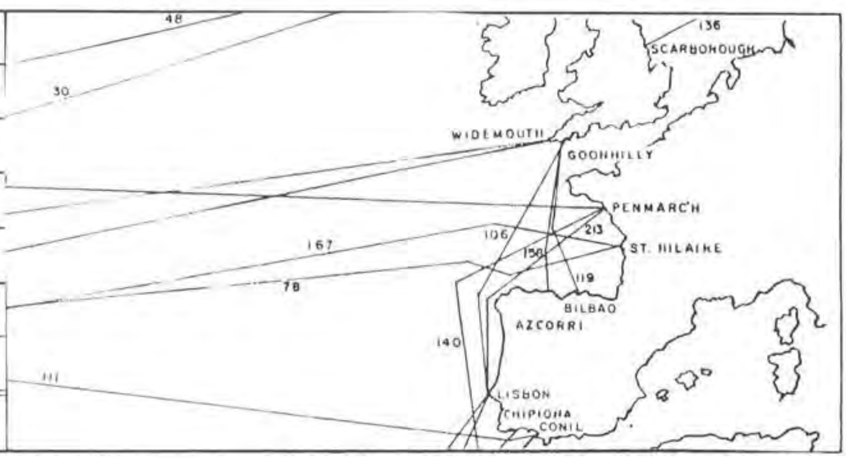
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380	now 1380	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	990/990	SYSTEM CURRENT	0.490 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	8.7
SUBMERGED ELECTRONICS	4.4
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	0.3
INSTALLATION	1.3
TOTAL	15.6
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **159**

OFFICIAL NAME	U.K. - Netherlands 9		
OTHER NAMES	Joss Bay-Domburg	Broadstairs - Domburg	
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Broadstairs, Kent	TERMINUS B	Domburg, Walcheren
LANDING POINT A	Joss Bay	LANDING POINT B	Domburg
COORDINATES A	$51^{\circ}23'N \times 01^{\circ}27'E$	COORDINATES B	$51^{\circ}34'N \times 03^{\circ}30'E$

OWNER A	British Post Office	CIRCUITS HELD	1380h
OWNER B	Administration of PTT	CIRCUITS HELD	480h
I R U HOLDERS			
CIRCUITS HELD			
	Additional owner: Deutsche Bundespost - 900h		

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	82	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14 M)

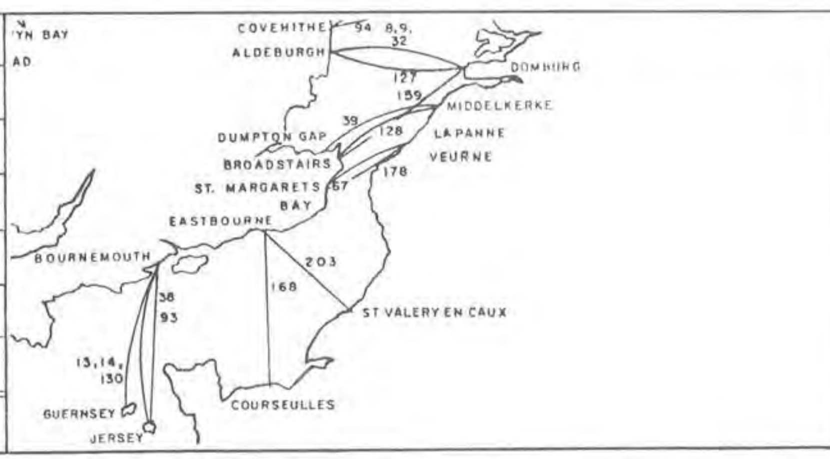
CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	13	REPEATER SPACING	6.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				

NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016 + 7996-13700 kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380	now 1380	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones and Cables Ltd		CONSTRUCTION CONTRACTOR	STC	
POWER FEED MODE	double end	NOMINAL VOLTAGE 200/200	SYSTEM CURRENT	0.500 A	
TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED	

COST	$ MILLION
CABLE	1.3
SUBMERGED ELECTRONICS	0.6
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	-
INSTALLATION	0.5
TOTAL	3.1
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **160**

OFFICIAL NAME	Algeria-Spain	ACRONYM	ALPAL
OTHER NAMES	Alger - Palma	Alger - Balearic Islands	
COUNTRY A	Spain	COUNTRY B	Algeria
TERMINUS A	Palma de Mallorca	TERMINUS B	Bordj El Kiffan (Alger)
LANDING POINT A	Cala Mayor	LANDING POINT B	Bordj El Kiffan
COORDINATES A	$39^{\circ}33'$N x $02^{\circ}36$E	COORDINATES B	$36^{\circ}44'$N x $03^{\circ}10'$E

OWNER A	Compañía Telefónica Nacional de España	CIRCUITS HELD	480h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	480h
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	Various		
CIRCUITS LEASED	121		

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	182	SINGLE OR TWIN	single	SYSTEM TYPE	S 5

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	MARCEL BAYARD

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	NUMBER OF REPEATERS	17	REPEATER SPACING	12 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz TRANSMISSION FREQUENCIES 312-2292 + 2792-4772 kHz

NUMBER OF EQUALIZERS none EQUALIZATION METHOD -

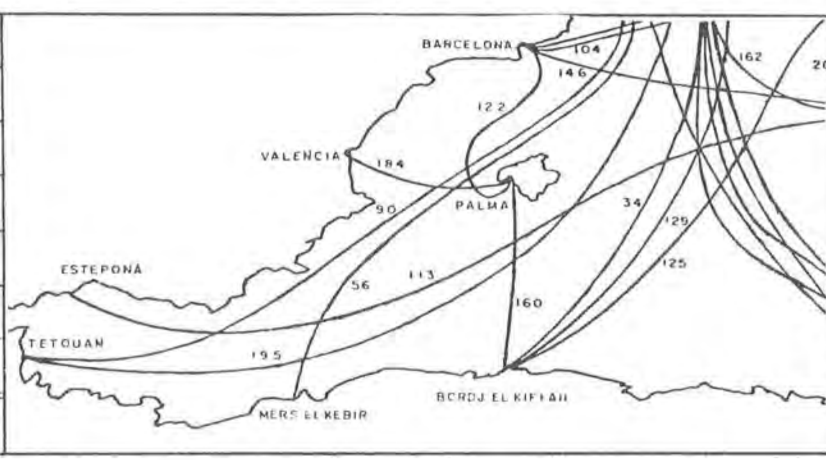
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT ALCATEL CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE double end NOMINAL VOLTAGE 230/230 SYSTEM CURRENT 0.180 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST Estimated	$ MILLION
CABLE	2.7
SUBMERGED ELECTRONICS	0.8
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	-
INSTALLATION	0.4
TOTAL	4.7
SYSTEM DESIGN LIFE 25 years	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **161**

OFFICIAL NAME	Tientsin-Tailen		
OTHER NAMES			
COUNTRY A	People's Republic of China	COUNTRY B	People's Republic of China
TERMINUS A	Tientsin	TERMINUS B	Tailen
LANDING POINT A	Tientsin	LANDING POINT B	Tailen
COORDINATES A	$39^{\circ}10'N \times 117^{\circ}42'E$	COORDINATES B	$38^{\circ}56'N \times 121^{\circ}12'E$

OWNER	Post and Telegraph Bureau	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE 1975 | NATURE OF SERVICE commercial | CABLE MILES 216 | SINGLE OR TWIN single | SYSTEM TYPE KS 120

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 1.00" 25.4 mm

CABLE MANUFACTURER Ocean Cable Company Limited | CABLESHIP USED: YOUDIAN YIHAO

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state | NUMBER OF REPEATERS 15 | REPEATER SPACING 19 nm

REPEATER MANUFACTURER Fujitsu Limited

NOMINAL TRANSMISSION BANDWIDTH 240 + 240 kHz | TRANSMISSION FREQUENCIES 312-552 + 768-1008 kHz

NUMBER OF EQUALIZERS none | EQUALIZATION METHOD –

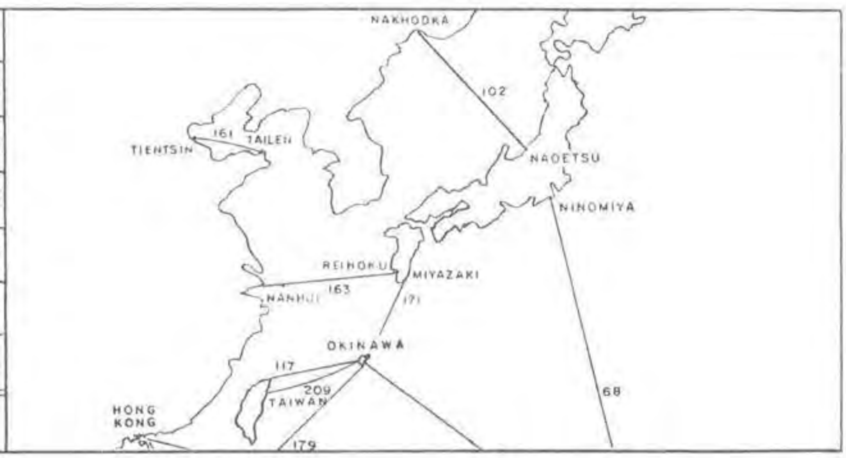
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 now 120 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Fujitsu Limited | CONSTRUCTION CONTRACTOR Fujitsu Ltd.

POWER FEED MODE double end | NOMINAL VOLTAGE 200/200 | SYSTEM CURRENT 0.150 A

TASI TYPE – CIRCUITS USED – CIRCUITS DERIVED – TOTAL CIRCUITS – DATE APPLIED –

COST	$ MILLION
CABLE	2.2
SUBMERGED ELECTRONICS	0.7
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	0.5
INSTALLATION	0.0
TOTAL	4.2
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **162**

OFFICIAL NAME	MARPAL	ACRONYM	MARPAL
OTHER NAMES	Marseille-Palo		
COUNTRY A	France	COUNTRY B	Italy
TERMINUS A	Marseille	TERMINUS B	Palo
LANDING POINT A	Marseille	LANDING POINT B	Palo
COORDINATES A	43°16'N x 05°23'E	COORDINATES B	41°55'N x 12°07'E

OWNER	Societá Impianti Cablofonici SRL, a joint enterprise of Azienda di Stato per i Servizi Telefonici, France Câble et Rádio , Italcable, and the PTTs of France and Israel
I R U HOLDERS	See opposite page
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	370	SINGLE OR TWIN	single	SYSTEM TYPE	S25

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.56" 38.1mm

CABLE MANUFACTURER Les Câbles de Lyon — CABLESHIP USED: MARCEL BAYARD

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state — NUMBER OF REPEATERS 81 — REPEATER SPACING 5 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 10652+10652kHz — TRANSMISSION FREQUENCIES 812-11464+14576-25228 kHz

NUMBER OF EQUALIZERS 4 — EQUALIZATION METHOD remote controlled

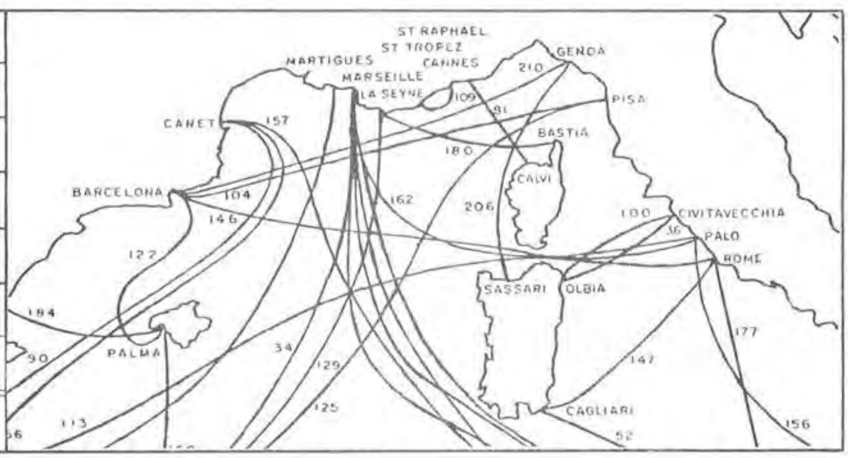
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 2580 now 2580 — CHANNEL SPACING, INITIAL 4 kHz now 4kHz

TERMINAL EQUIPMENT MANUFACTURER CIT ALCATEL — CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE double end — NOMINAL VOLTAGE 1400/1400 — SYSTEM CURRENT 0.365 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	6.0
SUBMERGED ELECTRONICS	8.0
TERMINAL AND POWER FEED	1.3
TERMINAL STATIONS	-
INSTALLATION	1.0
TOTAL	16.3
SYSTEM DESIGN LIFE 25 years	



ALLOCATIONS

	Israel	Italcable	ASST	FCR/France
Owners	840h	340h	1380h	2560h

IRU Holders with Israel

ATT	300
France	185
DBP	120
Switzerland	84
BPO	64
TGC	36
Belgium	24
Netherlands	24
Austria	13
ITTWC	4
RCAGC	4
WUI	4
FTCC	1

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **163**

OFFICIAL NAME	East China Sea Cable	ACRONYM	ECSC
OTHER NAMES	Japan - People's Republic of China		
COUNTRY A	Japan	COUNTRY B	People's Republic of China
TERMINUS A	Reihoku, Kumamoto, Kyushu	TERMINUS B	Nanhui, Shanghai
LANDING POINT A	Reihoku	LANDING POINT B	Nanhui Hsien
COORDINATES A	$32^{\circ}30'$N x $130^{\circ}03'$ E	COORDINATES B	$30^{\circ}52'$N x $121^{\circ}52'$E

OWNER A	Kokusai Denshin Denwa Company Limited	CIRCUITS HELD	480h
OWNER B	Post and Telegraph Bureau, People's Republic of China	CIRCUITS HELD	480h
	Operating Agency: The Postal and Telecommunications Administration		
	of Shanghai		

DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	470	SINGLE OR TWIN	single	SYSTEM TYPE	CS 5 M

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Ltd.	CABLESHIP USED:	KDD MARU

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state temperature-controlled gain	NUMBER OF REPEATERS	66	REPEATER SPACING	7.3 nm

REPEATER MANUFACTURER	Nippon Electric Company and Fujitsu Limited

NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+3068-5048 kHz
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	fixed and variable-computed and assembled

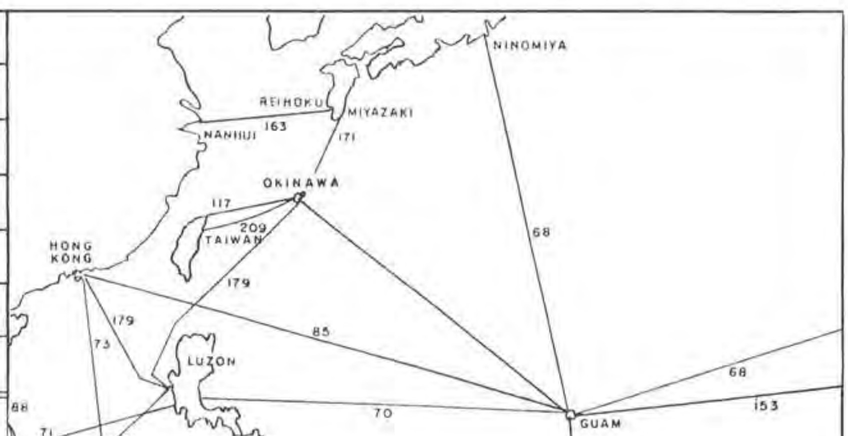
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now 480	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC	CONSTRUCTION CONTRACTOR	KDD

POWER FEED MODE	double end	NOMINAL VOLTAGE	580/580	SYSTEM CURRENT	0.100 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	5.3
SUBMERGED ELECTRONICS	3.5
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	0.6
INSTALLATION	0.8
TOTAL	11.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

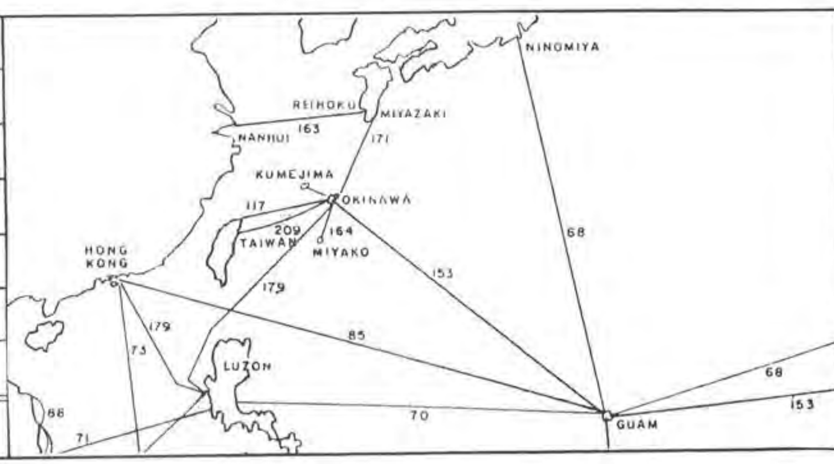
SYSTEM REFERENCE NUMBER **164**

OFFICIAL NAME	Okinawa-Miyako		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Gushichan, Okinawa	TERMINUS B	Miyako Jima
LANDING POINT A	Gushichan	LANDING POINT B	Ueno
COORDINATES A	$26^{o}07'N \times 127^{o}44'E$	COORDINATES B	$24^{o}40'N \times 125^{o}28'E$

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1975	NATURE OF SERVICE	commercial	CABLE MILES	194	SINGLE OR TWIN	single	SYSTEM TYPE	CS 36M D2
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.50'' 38.1 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited					CABLESHIP USED:	KUROSHIO MARU		
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	64	REPEATER SPACING	3.1 nm		
REPEATER MANUFACTURER	Nippon Electric Company and Fujitsu Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	20605+3872 kHz	TRANSMISSION FREQUENCIES	4979-25584+31612-35484 kHz						
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	magnetic external stepping						
NOMINAL VOICE CIRCUIT CAPACITY	900 + 2 color television channels			CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC			CONSTRUCTION CONTRACTOR	NTTPC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	600/600	SYSTEM CURRENT	0.156 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	2.33
SUBMERGED ELECTRONICS	4.86
TERMINAL AND POWER FEED	0.37
TERMINAL STATIONS	0.30
INSTALLATION	0.66
TOTAL	8.52
SYSTEM DESIGN LIFE	20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **165**

OFFICIAL NAME	Fridtorp - Hornsudde		
OTHER NAMES	Gotland - Swedish Mainland		
COUNTRY A	Sweden	COUNTRY B	Sweden
TERMINUS A	Fridtorp, Gotland	TERMINUS B	Hornsudde
LANDING POINT A	Fridtorp	LANDING POINT B	Hornsudde
COORDINATES A	$57^{o}44'N \times 18^{o}20'E$	COORDINATES B	$57^{o}37'N \times 16^{o}44'E$

OWNER	Administration of Telecommunications - TELEVERKET	CIRCUITS HELD All
	In 1976 four repeaters were inserted in the previously-laid (1947) cable,	
	raising the circuit capacity from 23 to 120	

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	50	SINGLE OR TWIN	single	SYSTEM TYPE	

CABLE DESCRIPTION armored polyethylene coaxial — CABLE SIZE 0.62" 15.7mm

CABLE MANUFACTURER Submarine Cables Limited — CABLESHIP USED: PETER FABER (2)

REPEATER DESCRIPTION monocontainer inflexible bidirectional solid-state — NUMBER OF REPEATERS 4 — REPEATER SPACING 11.9 nm

REPEATER MANUFACTURER Standard Telephones and Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 492 + 492 kHz — TRANSMISSION FREQUENCIES 60-552 + 812-1304 kHz

NUMBER OF EQUALIZERS none — EQUALIZATION METHOD -

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 120 — 1974 120 — CHANNEL SPACING, INITIAL 4 kHz — 1974 4 kHz

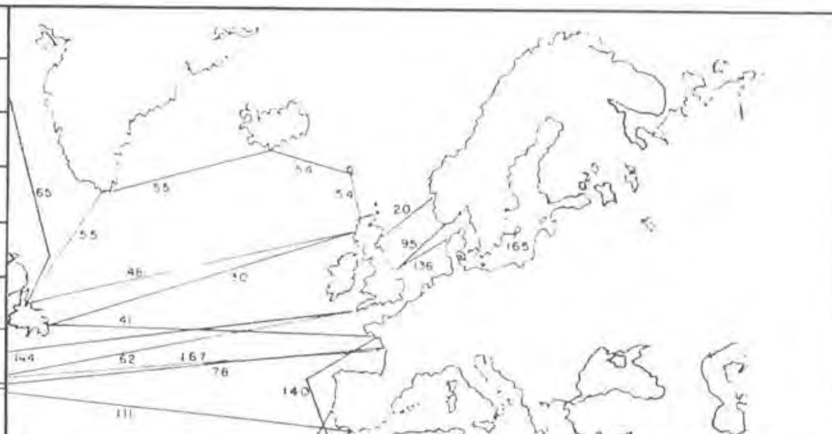
TERMINAL EQUIPMENT MANUFACTURER STC — CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end — NOMINAL VOLTAGE 80/80 — SYSTEM CURRENT 0.210 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	0.15
SUBMERGED ELECTRONICS	0.25
TERMINAL AND POWER FEED	0.10
TERMINAL STATIONS	-
INSTALLATION	0.10
TOTAL	0.60

SYSTEM DESIGN LIFE 20 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **166**

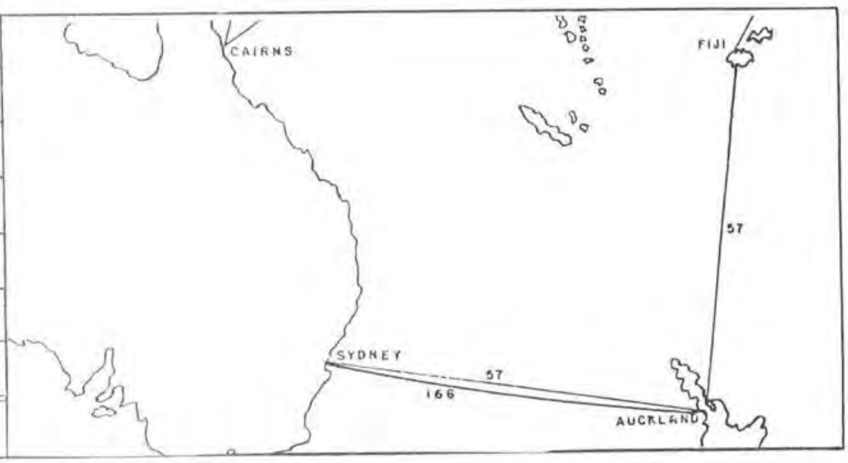
OFFICIAL NAME	Tasman Sea Cable		
OTHER NAMES	TASMAN		
COUNTRY A	Australia	COUNTRY B	New Zealand
TERMINUS A	Sydney	TERMINUS B	Auckland
LANDING POINT A	Bondi Beach	LANDING POINT B	Muriwai Beach
COORDINATES A	$33^{\circ}44'N \times 151^{\circ}16'E$	COORDINATES B	$36^{\circ}48'N \times 174^{\circ}25'E$

OWNER A	Overseas Telecommunications Commission (Australia)	CIRCUITS HELD	480h
OWNER B	New Zealand Post Office	CIRCUITS HELD	480h

I R U HOLDERS	Netherlands	SACC	Suisse	Ireland	Austria	Norfolk	DBP	BTI
CIRCUITS HELD	10	7	6	2	2	5	7	50

DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	1190	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5 M)
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	0.99" 25.1 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited					CABLESHIP USED:	MERCURY		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state			NUMBER OF REPEATERS	155	REPEATER SPACING	7.6 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292 + 2792-4772 kHz						
NUMBER OF EQUALIZERS	12	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now	480	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.			CONSTRUCTION CONTRACTOR	STC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	3000/3000	SYSTEM CURRENT	0.150 A				
TASI TYPE	–	CIRCUITS USED	–	CIRCUITS DERIVED	–	TOTAL CIRCUITS	–	DATE APPLIED	–

COST	$ MILLION
CABLE	7.7
SUBMERGED ELECTRONICS	5.2
TERMINAL AND POWER FEED	0.5
TERMINAL STATIONS	-
INSTALLATION	0.9
TOTAL	14.3
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

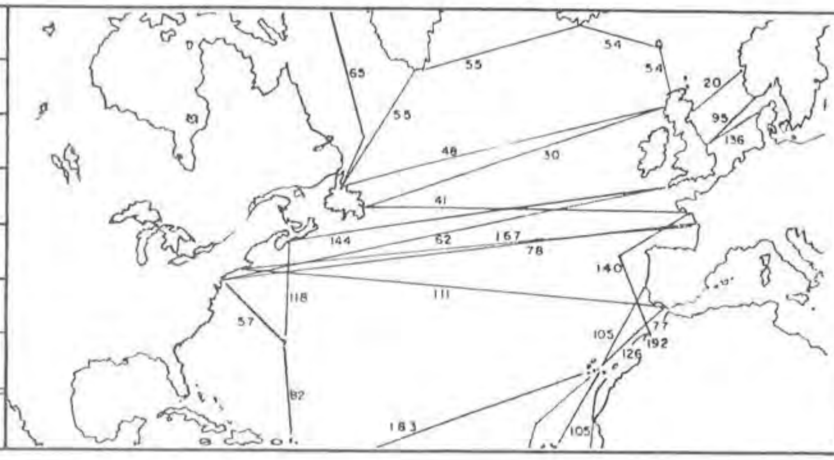
SYSTEM REFERENCE NUMBER **167**

OFFICIAL NAME	Transatlantic 6	ACRONYM	TAT 6
OTHER NAMES			
COUNTRY A	United States	COUNTRY B	France
TERMINUS A	Green Hill, Rhode Island	TERMINUS B	St. Hilaire de Riez, Vendee
LANDING POINT A	Green Hill Point	LANDING POINT B	St. Hilaire de Riez
COORDINATES A	$41^{o}22'N \times 71^{o}36W$	COORDINATES B	$46^{o}44'N \times 01^{o}59'W$

See opposite page for details of participation

DATE IN SERVICE	1976
NATURE OF SERVICE	commercial
CABLE MILES	3396
SINGLE OR TWIN	single
SYSTEM TYPE	SG
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.70" 43.2 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd., Les Câbles de Lyon, and Simplex
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state
NUMBER OF REPEATERS	694
REPEATER SPACING	5.1 nm
REPEATER MANUFACTURER	Western Electric Company CABLESHIPS USED: LONG LINES, VERCORS
NOMINAL TRANSMISSION BANDWIDTH	12000+12000 kHz
TRANSMISSION FREQUENCIES	1.0-13.5+16.7-29.3 MHz
NUMBER OF EQUALIZERS	37
EQUALIZATION METHOD	remote control
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	4000 now 4000
CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT - ALCATEL
CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end
NOMINAL VOLTAGE	3500/3500
SYSTEM CURRENT	0.657 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	103
SUBMERGED ELECTRONICS	78
TERMINAL AND POWER FEED	5
TERMINAL STATIONS	1
INSTALLATION	10
TOTAL	197
SYSTEM DESIGN LIFE	25 years



167
continued

ALLOCATION OF CHANNELS

	ATT	FTCC	TRTT	ITTWC	RCAGC	TGC	WUI
BPO	466	24	5	24	34	84	32
CPRM	8				1		
Spain(CTNE)	36	1					
Cyprus	5			1			
Ireland	37	1			1		
Luxembourg	10			1			
Switzerland	132	1	1	7	11		2
Denmark	20				1		
Finland	14						
Turkey	7			1			
Hungary	4				1		
Greece	78			1			
ITALCABLE	69		3	4	1		5
Kenya	3			1			
Tunisia	4			1	1		
U.S.S.R.	4			1	1		
Poland				1			
Lebanon	9			1	3		1
Austria	24	1	1	1			2
Israel	57			1	1		1
Kuwait	6						
Algeria					1		
Czechoslovakia	2				1		
Germany, Dem. Rep.	3						
Germany, Fed. Rep.	258	4	4	4	9		5
Bulgaria					1		
Morocco	2			1	1		1
Saudi Arabia	1			1			
Norway	20			1	1		
India	51			3	3		2
Sri Lanka	2						
Indonesia	18			1			
Libya	4						
Netherlands	123	1	3	17	13		12
Egypt	12			1	1		2
Belgium	120		2	8	6		2
France	261	62		7	10		6
Ivory Coast				1			
Sweden	18			1			2
South Africa				1			
Syria	3			1			
Senegal				1			
Bangladesh	2						
Peru					1		
Spain (ENTE)				1			1
Themselves			2	1			
Pakistan	2						

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **168**

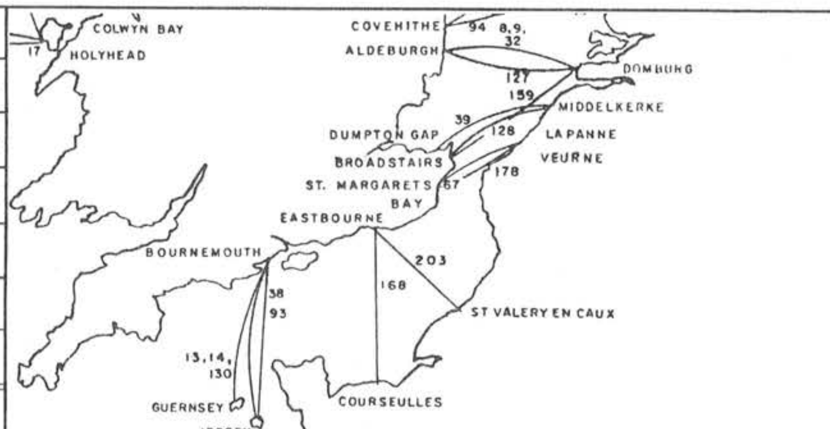
OFFICIAL NAME	France-U.K. 1		
OTHER NAMES	Courseulles-Eastbourne		
COUNTRY A	France	COUNTRY B	England
TERMINUS A	Courseulles	TERMINUS B	Eastbourne
LANDING POINT A	Graye-Sur-Mer	LANDING POINT B	Cuckmere
COORDINATES A	49°20'N x 00°28'W	COORDINATES B	50°45'N x 00°09'E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	3440h
OWNER B	British Post Office	CIRCUITS HELD	3440h
I R U HOLDERS	See page opposite		
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	104	SINGLE OR TWIN	single	SYSTEM TYPE	S 25

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	VERCORS
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	NUMBER OF REPEATERS	26
REPEATER SPACING	4.4 nm		
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT ALCATEL		
NOMINAL TRANSMISSION BANDWIDTH	10562+10562 kHz	TRANSMISSION FREQUENCIES	812-11464+14576-25228 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	remote controlled
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3440 now 3440	CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM
POWER FEED MODE	double end	NOMINAL VOLTAGE	500/500
SYSTEM CURRENT	0.365 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST	$ MILLION
CABLE	2.6
SUBMERGED ELECTRONICS	1.8
TERMINAL AND POWER FEED	1.6
TERMINAL STATIONS	-
INSTALLATION	0.5
TOTAL	7.0
SYSTEM DESIGN LIFE	25 years



ALLOCATION OF CHANNELS

	ATT	FTCC	ITTWC	RCAGC	TGC	WUI
BPO	466	12	24	34	84	32
Ireland	37			1		
Denmark	20			1		
Finland	14					
Kenya	3					
Norway	20		1	1		
India	29		1	1		
Sri Lanka	2					
Sweden	18		1			2
Bangladesh	2					
Peru				1		
Saudi Arabia			1			

169) unassigned
170)

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **171**

OFFICIAL NAME	Okinawa - Miyazaki		
OTHER NAMES			
COUNTRY A	Japan (Okinawa)	COUNTRY B	Japan (Kyushu)
TERMINUS A	Chinen	TERMINUS B	Miyazaki
LANDING POINT A	Chinen	LANDING POINT B	Esabaru
COORDINATES A	$26^{\circ}10'$N x $127^{\circ}50'$E	COORDINATES B	$31^{\circ}51'$N x $131^{\circ}27'$E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	483	SINGLE OR TWIN	single	SYSTEM TYPE	CS 36M D1

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Limited	CABLESHIP USED:	KUROSHIO MARU

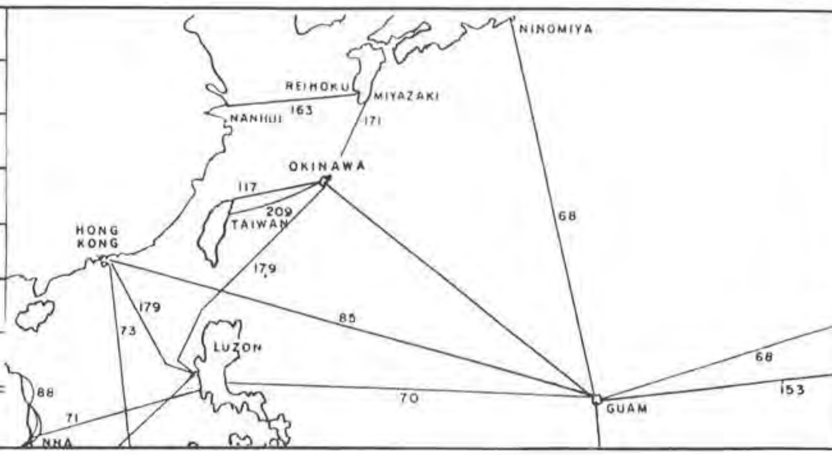
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	NUMBER OF REPEATERS	161	REPEATER SPACING	3.1 nm
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.				
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35468 kHz		
NUMBER OF EQUALIZERS	7	EQUALIZATION METHOD	magnetic adjustment by external stepping		

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	now	2700	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz

TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd. and NEC			CONSTRUCTION CONTRACTOR	NTTPC
POWER FEED MODE	double end	NOMINAL VOLTAGE	1600/1600	SYSTEM CURRENT	0.156 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	7.61
SUBMERGED ELECTRONICS	12.36
TERMINAL AND POWER FEED	0.29
TERMINAL STATIONS	0.30
INSTALLATION	1.52
TOTAL	22.08
SYSTEM DESIGN LIFE	20 years



172 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **173**

OFFICIAL NAME	Australia-Papua New Guinea Cable	ACRONYM	A - PNG
OTHER NAMES			
COUNTRY A	Australia	COUNTRY B	Papua New Guinea
TERMINUS A	Cairns, Queensland	TERMINUS B	Port Moresby, Papua
LANDING POINT A	Cairns	LANDING POINT B	Port Moresby
COORDINATES A	17°08'S x 145°29'E	COORDINATES B	09°24'S x 147°09'E

OWNER A	Overseas Telecommunications Commission (Australia)	CIRCUITS HELD	480h
OWNER B	Government of Papua New Guinea	CIRCUITS HELD	480h
I R U HOLDERS	New Zealand Post Office		
CIRCUITS HELD	26		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	485	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5 M)

CABLE DESCRIPTION: unarmored polyethylene coaxial — CABLE SIZE: 0.99" 25.1 mm

CABLE MANUFACTURER: Standard Telephones & Cables Limited — CABLESHIP USED: JOHN W MACKAY

REPEATER DESCRIPTION: monocontainer inflexible bidirectional solid-state — NUMBER OF REPEATERS: 65 — REPEATER SPACING: 7.5 nm

REPEATER MANUFACTURER: Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH: 1980-1980 kHz — TRANSMISSION FREQUENCIES: 312-2292 + 2792-4772 kHz

NUMBER OF EQUALIZERS: 4 — EQUALIZATION METHOD: adjusted on board

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 480 now 480 — CHANNEL SPACING, INITIAL: 4 kHz now 4 kHz

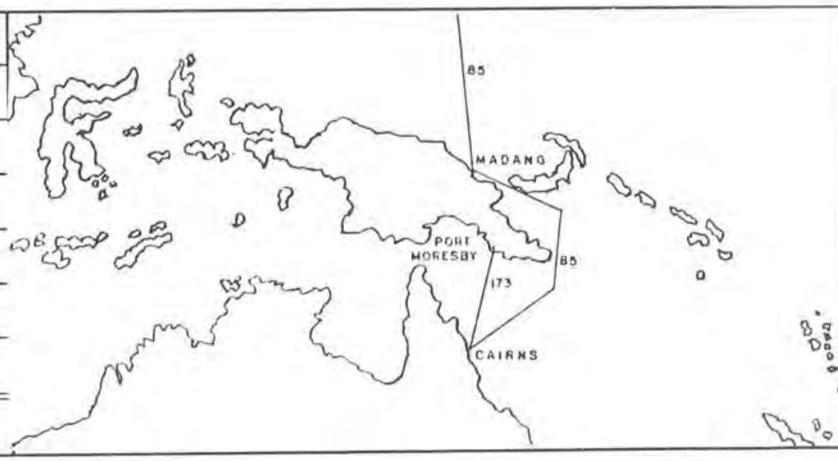
TERMINAL EQUIPMENT MANUFACTURER: Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR: STC

POWER FEED MODE: double end — NOMINAL VOLTAGE: 1100/1100 — SYSTEM CURRENT: 0.150 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	6.2
SUBMERGED ELECTRONICS	4.2
TERMINAL AND POWER FEED	1.0
TERMINAL STATIONS	0.3
INSTALLATION	0.6
TOTAL	12.3

SYSTEM DESIGN LIFE: 25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **174**

OFFICIAL NAME	Italy-Turkey		
OTHER NAMES			
COUNTRY A	Italy	COUNTRY B	Turkey
TERMINUS A	Catania, Sicily	TERMINUS B	Antalya
LANDING POINT A	Catania	LANDING POINT B	Antalya
COORDINATES A	37°29'N x 15°04'E	COORDINATES B	36°52'N x 30°43'E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	480h
OWNER B	Administration of Posts, Telegraphs, and Telephones	CIRCUITS HELD	480h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

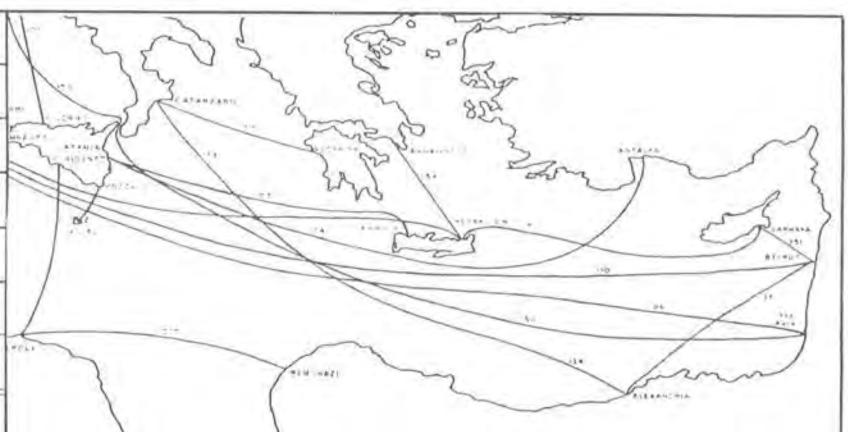
DATE IN SERVICE	1976	NATURE OF SERVICE	commercial	CABLE MILES	1083	SINGLE OR TWIN	single	SYSTEM TYPE	NC (5 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	0.99" 25.1 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	143	REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292 + 2792-4772 kHz		
NUMBER OF EQUALIZERS	11	EQUALIZATION METHOD	adjusted on board		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	now	480	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1955/1955	SYSTEM CURRENT	0.150 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	4.5
SUBMERGED ELECTRONICS	9.0
TERMINAL AND POWER FEED	1.3
TERMINAL STATIONS	-
INSTALLATION	1.9
TOTAL	16.7
SYSTEM DESIGN LIFE	25 years



175
176
Unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **177**

OFFICIAL NAME	Rome-Palermo		
OTHER NAMES			
COUNTRY A	Italy	COUNTRY B	Italy
TERMINUS A	Pomezia	TERMINUS B	Palermo, Sicily
LANDING POINT A	Castelpotziana	LANDING POINT B	Palermo
COORDINATES A	$41^{\circ}40'$N x $12^{\circ}25'$E	COORDINATES B	$38^{\circ}08'$N x $13^{\circ}20'$E

OWNER	Azienda di Stato per i Servici Telefonici	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

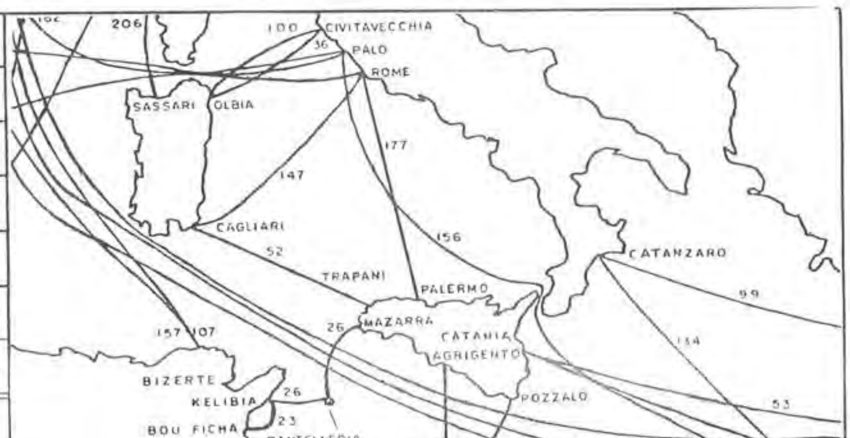
DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	251	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	95	REPEATER SPACING	2.75 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	17000+17000 kHz	TRANSMISSION FREQUENCIES	1900-19000+27200-44300 kHz		
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	assembled on board		
NOMINAL VOICE CIRCUIT CAPACITY	1800 + 2-way color television	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	525/525	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-						

COST	$ MILLION
CABLE	6.0
SUBMERGED ELECTRONICS	7.8
TERMINAL AND POWER FEED	1.9
TERMINAL STATIONS	0.8
INSTALLATION	1.0
TOTAL	14.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **178**

OFFICIAL NAME	U.K. - BELGIUM 4		
OTHER NAMES	St. Margaret's Bay - Veurne	St. Margaret's Bay - St. Idesbald	
COUNTRY A	England	COUNTRY B	Belgium
TERMINUS A	St. Margaret's Bay	TERMINUS B	Veurne
LANDING POINT A	St. Margaret's Bay	LANDING POINT B	St. Idesbald
COORDINATES A	$51^{\circ}09'$N x $01^{\circ}24'$E	COORDINATES B	$51^{\circ}06'$N x $02^{\circ}36'$E

OWNER	North Sea Cable Conference, composed of the British Post Office, Deutsche Bundespost,				
	and the telecommunications administrations of the Netherlands and Belgium.				
	BPO	DBP	Netherlands	Belgium	Denmark
	3900h	2100h	900h	900h	300h

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	56	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45 M)

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm		
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	ALERT (4)		
REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	22	REPEATER SPACING	2.75 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited				
NOMINAL TRANSMISSION BANDWIDTH	17000+17000kHz	TRANSMISSION FREQUENCIES	1900-19000+27200-44300 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3900 now 3900	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	240/240	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.9
SUBMERGED ELECTRONICS	1.4
TERMINAL AND POWER FEED	2.3
TERMINAL STATIONS	1.0
INSTALLATION	0.8
TOTAL	7.5
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **179**

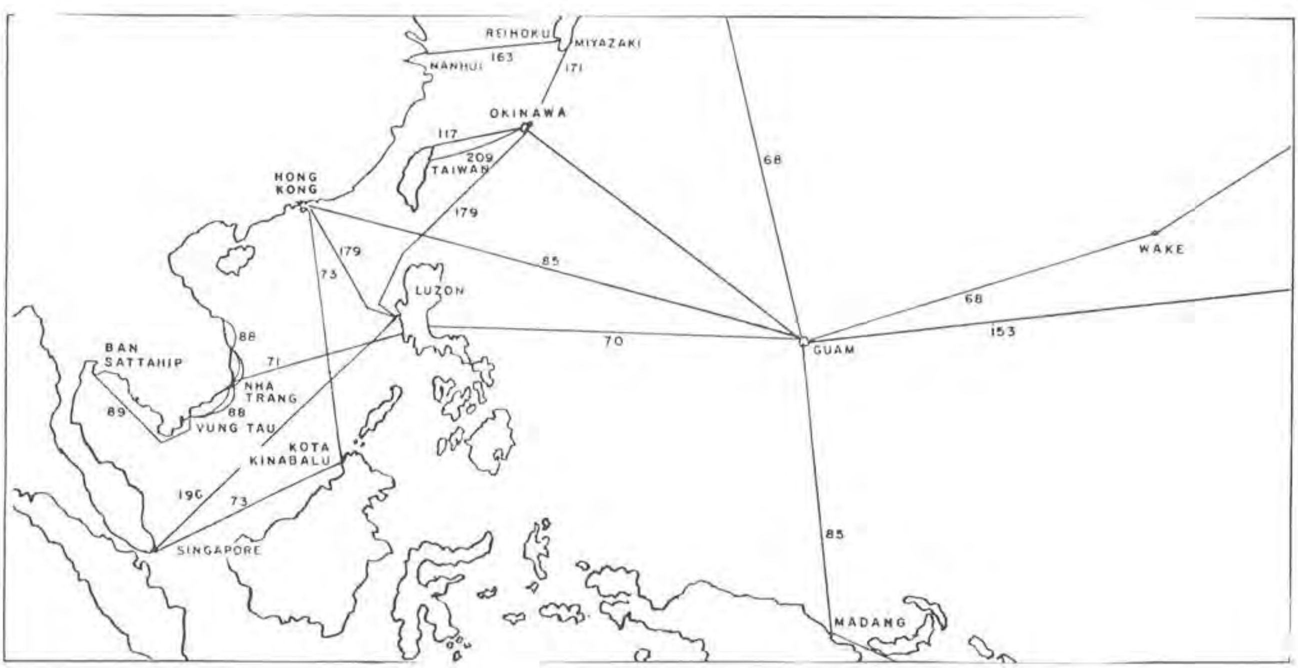
OFFICIAL NAME	Okinawa - Luzon - Hong Kong
ACRONYM	OLUHO
OTHER NAMES	

COUNTRY A	Japan	COUNTRY B	Philippine Republic
TERMINUS A	Gushikami, Okinawa	TERMINUS B	Currimao, Luzon
LANDING POINT A	Gushikami	LANDING POINT B	Currimao
COORDINATES A	26°07'N x 127°45'E	COORDINATES B	18°03'N x 120°29'E

COUNTRY C	Hong Kong	COUNTRY D	
TERMINUS C	Deep Water Bay	TERMINUS D	
LANDING POINT C	Deep Water Bay	LANDING POINT D	
COORDINATES C	22°28'N x 114°06'E	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 748	BC 475					
DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	CS 12 M and NE (14 M)
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.50" 38.1 mm 1.47" 37.3 mm
CABLE MANUFACTURER	AB: Ocean Cable Company Ltd.	BC: Standard Telephones and Cables Ltd.					



OWNERS *	KDD, ETPI, C&W, and OTC(A)
CIRCUITS HELD	see accompanying page
I R U HOLDERS	
CIRCUITS HELD	
LESSEES	WUI GMCR PLDT
CIRCUITS LEASED	2 1 2

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state monocontainer inflexible bidirectional solid-state — REPEATER SPACING AB:6.5 BC:6.6
NUMBER OF REPEATERS	AB 121 BC 74 CD DE EF
REPEATER MANUFACTURER	AB: Nippon Electric Company Ltd. and Fujitsu Ltd. BC: Standard Telephones and Cables Limited
NUMBER OF EQUALIZERS	AB 7 BC 4 CD DE EF
EQUALIZATION METHOD	Fixed and variable; AB: Computed and assembled on board BC: Computed and assembled on board
TERMINAL EQUIPMENT MANUFACTURER	AB: Nippon Electric Company Ltd. and Fujitsu Ltd. BC: Standard Telephones and Cables Limited
POWER FEED MODE	AB double end BC double end CD DE EF
NOMINAL VOLTAGE	1020/1020 980/980 — SYSTEM CURRENT AB:0.100 A BC:0.470 A
NOMINAL TRANSMISSION BANDWIDTH	AB: 4952+4952 BC: 5700+5700 — TRANSMISSION FREQUENCIES 564-5516+7436-12388 kHz 312-6012+8000-13700 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AB:1200 BC:1380 now 1200 1380 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	CABLESHIPS USED: AB: KDD MARU BC: MERCURY, RECORDER(3)

CONSTRUCTION CONTRACTOR	AB: Kokusai Denshin Denwa Company Limited BC: Standard Telephones and Cables Limited

COST	AB $ MILLION	BC
CABLE	14.9	9.6
SUBMERGED ELECTR	6.9	4.9
TERMINAL AND POWER	1.4	1.1
TERMINAL STATIONS	-	-
INSTALLATION	1.8	1.4
TOTAL	25.0	17.0
SYSTEM DESIGN LIFE	25 years	

* KDD: Kokusai Denshin Denwa Company Limited
ETPI: Eastern Telecommunications Philippines Incorporated
C & W: Cable and Wireless Limited

ALLOCATIONS

	PLDT	ETPI	C&W	TELECOMS	KDD
KDD		12	595	81	
C&W		58		48	
OTC(A)			38		
ATT	16		23		
Philcom			3		39
JTM			11		18
HTC	3				
ITA			21		

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **180**

OFFICIAL NAME	Marseille-Bastia		
OTHER NAMES			
COUNTRY A	France (mainland)	COUNTRY B	France (Corsica)
TERMINUS A	Marseille	TERMINUS B	Bastia
LANDING POINT A	La Seyne	LANDING POINT B	Bastia
COORDINATES A	43°06 N x 05°54'E	COORDINATES B	42°42'N x 09°27'E

OWNER	Administration of Posts and Telecommunications	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	181	SINGLE OR TWIN	single	SYSTEM TYPE	S25

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	MARCEL BAYARD

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	NUMBER OF REPEATERS	42	REPEATER SPACING	5 nm

REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH	10562+10562kHz	TRANSMISSION FREQUENCIES	812-11464 + 14576-25288 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	remote controlled

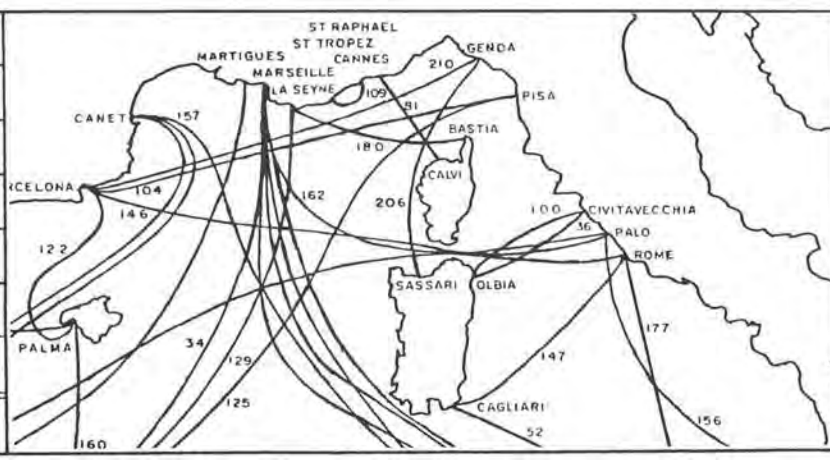
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2340	now 2340	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz

TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM

POWER FEED MODE	double end	NOMINAL VOLTAGE	730/730	SYSTEM CURRENT	0.365 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	4.1
SUBMERGED ELECTRONICS	2.1
TERMINAL AND POWER FEED	1.2
TERMINAL STATIONS	0.3
INSTALLATION	0.5
TOTAL	8.2
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

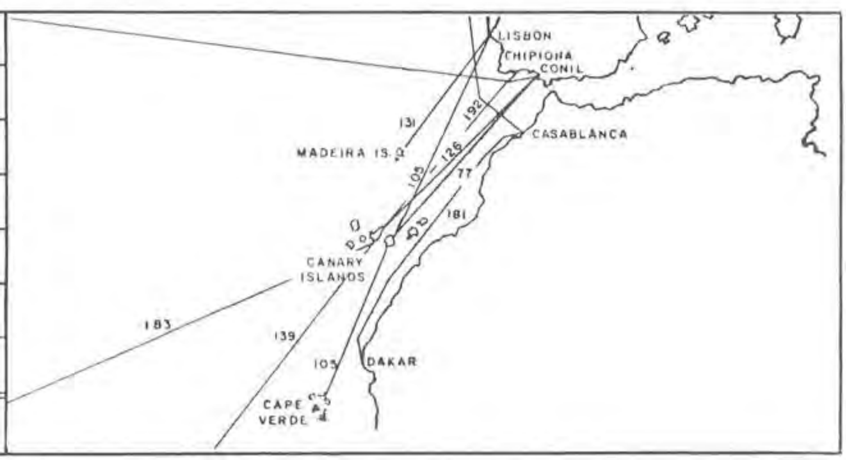
SYSTEM REFERENCE NUMBER **181**

OFFICIAL NAME	ANTINEA		
OTHER NAMES	Morocco - Senegal		
COUNTRY A	Morocco	COUNTRY B	Senegal
TERMINUS A	Casablanca	TERMINUS B	Dakar
LANDING POINT A	Casablanca	LANDING POINT B	Dakar
COORDINATES A	33°51'N x 7°38'W	COORDINATES B	14°42'N x 17°28'W

OWNER A	Administration of Posts, Telegraphs, and Telephones	CIRCUITS HELD	640h
OWNER B	Societé de Télécommunications Internationales du Sénégal	CIRCUITS HELD	640h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1977
NATURE OF SERVICE	commercial
CABLE MILES	1464
SINGLE OR TWIN	single
SYSTEM TYPE	S 5
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon
CABLESHIP USED:	VERCORS
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state
NUMBER OF REPEATERS	125
REPEATER SPACING	12 nm
REPEATER MANUFACTURER	Cie. Industrielle de Télécommunications CIT ALCATEL
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz
TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	10
EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	640 now 640
CHANNEL SPACING, INITIAL	3 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL
CONSTRUCTION CONTRACTOR	SUBMARCOM
POWER FEED MODE	double end
NOMINAL VOLTAGE	3500/3500
SYSTEM CURRENT	0.180 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	30
SUBMERGED ELECTRONICS	9
TERMINAL AND POWER FEED	1
TERMINAL STATIONS	1
INSTALLATION	3
TOTAL	44
SYSTEM DESIGN LIFE	25 years



182 unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **183**

OFFICIAL NAME	Spain - Venezuela		
OTHER NAMES	Venezuela - Canary Islands COLUMBUS		
COUNTRY A	Spain (Canary Islands)	COUNTRY B	Venezuela
TERMINUS A	Agüimes, Gran Canaria	TERMINUS B	Camuri
LANDING POINT A	Arinaga Beach	LANDING POINT B	Camuri Chico
COORDINATES A	27°51'N x 15°24'W	COORDINATES B	10°37'N x 66°53'W

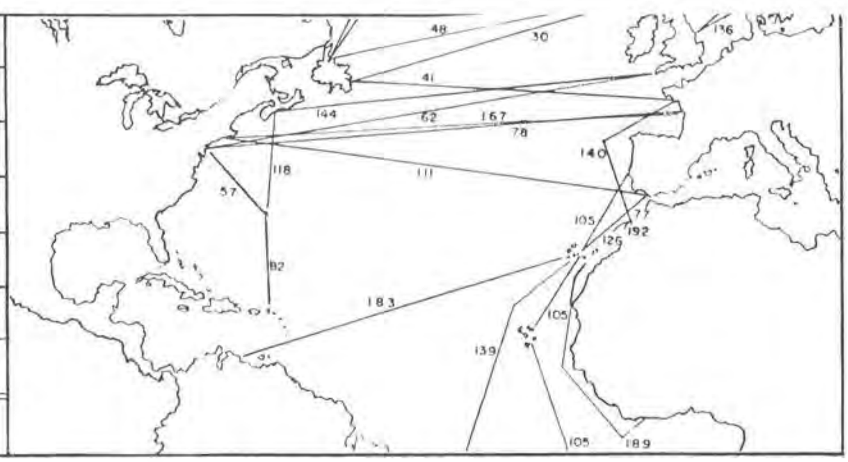
OWNER A	Compañía Telefónica Nacional de España	CIRCUITS HELD	1104h
OWNER B	Compañía Anónima Nacional de Teléfonos de Venezuela	CIRCUITS HELD	2576h

I R U HOLDERS	DBP	CPRM	PTT France	ITALCABLE	PTT Austria	Radio Austria	PTT Belgium	PTT Switzerland
CIRCUITS HELD	32	12	16	80	8	1	4	36
Netherlands	KDD	BTI			LESSEES	AAC&RPR		
37	13	16			CCTS LSD	32		

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	3239	SINGLE OR TWIN	single	SYSTEM TYPE	NE (14M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIPS USED:	MERCURY CABLE VENTURE
REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	503
REPEATER SPACING	6.5 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz	TRANSMISSION FREQUENCIES	312-6016 + 7966-13700 kHz
NUMBER OF EQUALIZERS	33	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380 now 1840	CHANNEL SPACING, INITIAL	4 kHz now 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Limited	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE	5300/8000
SYSTEM CURRENT	0.470A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST Estimated	$ MILLION
CABLE	56.4
SUBMERGED ELECTRONICS	28.6
TERMINAL AND POWER FEED	1.1
TERMINAL STATIONS	0.3
INSTALLATION	5.6
TOTAL	92.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **184**

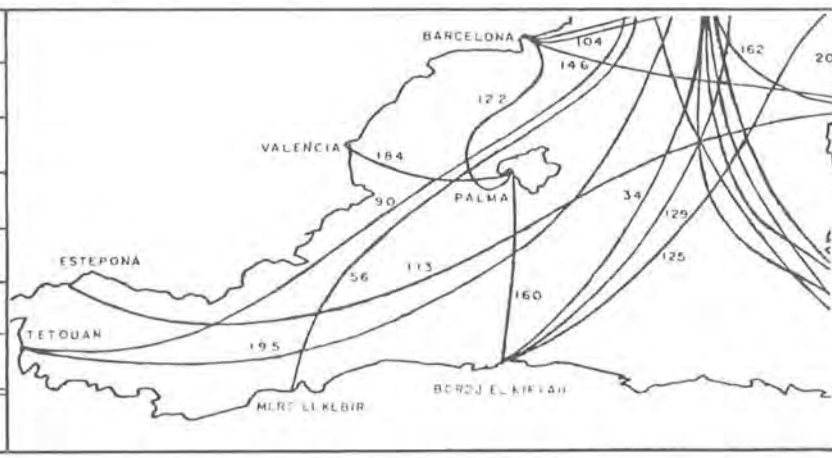
OFFICIAL NAME	Peninsula - Balearic Islands No. 2	ACRONYM	PENBAL 2
OTHER NAMES	Valencia - Palma de Mallorca		
COUNTRY A	Spain (mainland)	COUNTRY B	Spain (Balearic Islands)
TERMINUS A	Valencia	TERMINUS B	Palma de Mallorca
LANDING POINT A	Malvarrosa	LANDING POINT B	Cala Mayor
COORDINATES A	39°29'N x 0°19'W	COORDINATES B	39°33'N x 2°36'E

OWNER	Compañía Telefónica Nacional de España	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1977	NATURE OF SERVICE	commercial	CABLE MILES	162	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45 M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	MERCURY
REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	59
REPEATER SPACING	2.75 nm		
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	17000+17000kHz	TRANSMISSION FREQUENCIES	1916-18988+27212-44800 kHz
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3900 now 3900	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end	NOMINAL VOLTAGE	575/575
SYSTEM CURRENT	0.500 A		
TASI TYPE	-	CIRCUITS USED	-
CIRCUITS DERIVED	-	TOTAL CIRCUITS	-
DATE APPLIED	-		

COST Estimated	$ MILLION
CABLE	3.6
SUBMERGED ELECTRONICS	2.8
TERMINAL AND POWER FEED	1.6
TERMINAL STATIONS	-
INSTALLATION	0.6
TOTAL	8.6
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **186**

OFFICIAL NAME	Denmark-Norway 4		
OTHER NAMES	Hjørring-Arendal 2		
COUNTRY A	Norway	COUNTRY B	Denmark
TERMINUS A	Arendal	TERMINUS B	Hjørring, Vendsyssel
LANDING POINT A	Vrakvika	LANDING POINT B	Uggerby
COORDINATES A	58°25'N x 8°47'E	COORDINATES B	57°35'N x 10°05'E

OWNER A	Administration of Telecommunications	CIRCUITS HELD	2700h
OWNER B	Administration of Posts and Telegraphs	CIRCUITS HELD	2700h
IRU HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1977 | NATURE OF SERVICE commercial | CABLE MILES 77 | SINGLE OR TWIN single | SYSTEM TYPE KS 2700

CABLE DESCRIPTION armored polyethylene coaxial | CABLE SIZE 1.00" 25.4 mm

CABLE MANUFACTURER Ocean Cable Company Limited | CABLESHIP USED: MERCURY

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state | NUMBER OF REPEATERS 39 | REPEATER SPACING 2 nm

REPEATER MANUFACTURER Fujitsu Limited

NOMINAL TRANSMISSION BANDWIDTH 12672+12672 kHz | TRANSMISSION FREQUENCIES 4332-17004 + 22796-35468 kHz

NUMBER OF EQUALIZERS 2 | EQUALIZATION METHOD assembled on board

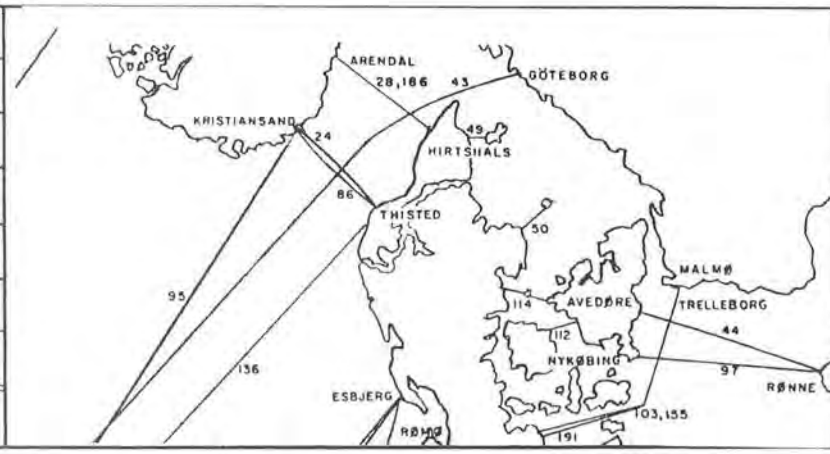
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 2700 now 2700 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Fujitsu Limited | CONSTRUCTION CONTRACTOR C. Itoh&Co. Ltd. with Fujitsu Ltd.

POWER FEED MODE double end | NOMINAL VOLTAGE 450/450 | SYSTEM CURRENT 0.150 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	2.58
SUBMERGED ELECTRONICS	2.65
TERMINAL AND POWER FEED	2.18
TERMINAL STATIONS	-
INSTALLATION	0.94
TOTAL	9.35
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **187**

OFFICIAL NAME	Kyushu - Iki - Tsushima
OTHER NAMES	

COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Maehara, Fukuoka, Kyushu	TERMINUS B	Gohnoura, Iki
LANDING POINT A	Nokita	LANDING POINT B	Ashibe
COORDINATES A	33°35'N x 130°24'E	COORDINATES B	33°48'N x 129°47'E

COUNTRY C	Japan	COUNTRY D	
TERMINUS C	Izuhara, Tsushima	TERMINUS D	
LANDING POINT C	Katsumiura	LANDING POINT D	
COORDINATES C	34°16'N x 129°20'E	COORDINATES D	

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 28	B C 44					
DATE IN SERVICE	1978	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	CS 36 MS
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.00" 24.4 mm
CABLE MANUFACTURER	Ocean Cable Company Limited						

OWNER	Nippon Telegraph and Telephone Public Corporation
CIRCUITS HELD	All
I R U HOLDERS	none
CIRCUITS HELD	-
LESSEES	none
CIRCUITS LEASED	-

REPEATER DESCRIPTION	Monocontainer flexible bidirectional solid-state — REPEATER SPACING 2.0 nm
NUMBER OF REPEATERS	A B 14 B C 22
REPEATER MANUFACTURER	Fujitsu Limited and Nippon Electric Company Limited
NUMBER OF EQUALIZERS	A B none B C none
EQUALIZATION METHOD	-
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC
POWER FEED MODE	A B double end B C double end
NOMINAL VOLTAGE	200/200 300/300 — SYSTEM CURRENT 0.156 A
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz — TRANSMISSION FREQUENCIES 4332-17004+22796-35468kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700 now 2700 — CHANNEL SPACING, INITIAL 4 kHz now 4 kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -
REMARKS	CABLESHIP USED: KUROSHIO MARU

CONSTRUCTION CONTRACTOR	Nippon Telegraph and Telephone Public Corporation

COST	$ MILLION
CABLE	2.76
SUBMERGED ELECTRONICS	3.04
TERMINAL AND POWER FEED	0.28
TERMINAL STATIONS	0.38
INSTALLATION	2.91
TOTAL	9.37
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **188**

OFFICIAL NAME	Tsushima By-Pass		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Izuhara, Tsushima	TERMINUS B	Saga, Tsushima
LANDING POINT A	Katsumiura	LANDING POINT B	Saga
COORDINATES A	$34^{\circ}16'$N x $129^{\circ}20'$E	COORDINATES B	$34^{\circ}27'$N x $129^{\circ}28'$E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1978	NATURE OF SERVICE	commercial	CABLE MILES	22	SINGLE OR TWIN	single	SYSTEM TYPE	CS 10 M
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited								
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	4	REPEATER SPACING	5.3 nm		
REPEATER MANUFACTURER	Fujitsu Limited and Nippon Electric Company Limited								
NOMINAL TRANSMISSION BANDWIDTH	3716+3716 kHz	TRANSMISSION FREQUENCIES	312-4028+5872-9588 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900	now	900	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC			CONSTRUCTION CONTRACTOR	NTTPC				
POWER FEED MODE	double end	NOMINAL VOLTAGE	100/100	SYSTEM CURRENT	0.090 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	0.86
SUBMERGED ELECTRONICS	0.79
TERMINAL AND POWER FEED	0.08
TERMINAL STATIONS	0.08
INSTALLATION	0.70
TOTAL	2.51
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **189**

OFFICIAL NAME	FRATERNITÉ		
OTHER NAMES	Senegal-Ivory Coast		
COUNTRY A	Senegal	COUNTRY B	Ivory Coast
TERMINUS A	Dakar	TERMINUS B	Abidjan
LANDING POINT A	Dakar	LANDING POINT B	Abidjan
COORDINATES A	$14^{o}42'N \times 17^{o}28'W$	COORDINATES B	$05^{o}21'N \times 04^{o}08'W$

OWNER A	Societé des Télécommunications Internationales du Sénégal	CIRCUITS HELD
OWNER B	Societé des Télécommunications Internationales de Côte d'Ivoire	CIRCUITS HELD
I R U HOLDERS		
CIRCUITS HELD		
LESSEES		
CIRCUITS LEASED		

DATE IN SERVICE 1978 | NATURE OF SERVICE commercial | CABLE MILES 1415 | SINGLE OR TWIN single | SYSTEM TYPE S5

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.50" 38.1 mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIP USED: VERCORS

REPEATER DESCRIPTION monocontainer flexible bidirectional solid-state | NUMBER OF REPEATERS 118 | REPEATER SPACING 12 nm

REPEATER MANUFACTURER Compagnie Industrielle de Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292 + 2792-4772 kHz

NUMBER OF EQUALIZERS 9 | EQUALIZATION METHOD adjusted on board

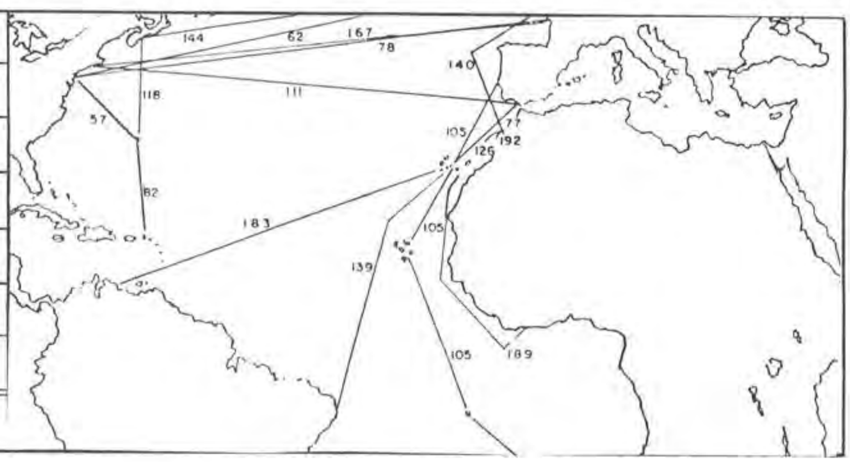
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 now 480 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT ALCATEL | CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE DOUBLE END | NOMINAL VOLTAGE 3000/3000 | SYSTEM CURRENT 0.180 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	31
SUBMERGED ELECTRONICS	9
TERMINAL AND POWER FEED	1
TERMINAL STATIONS	1
INSTALLATION	3
TOTAL	45
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **190**

OFFICIAL NAME	Grossenbrode-Burg By-Pass		
OTHER NAMES			
COUNTRY A	Federal Republic of Germany	COUNTRY B	Federal Republic of Germany
TERMINUS A	Grossenbrode	TERMINUS B	Burg, Fehmarn
LANDING POINT A	Grossenbrode	LANDING POINT B	Fehmarnsund
COORDINATES A	54°23'N x 11°08'E	COORDINATES B	54°24'N x 11°08'E

OWNER	Deutsche Bundespost	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

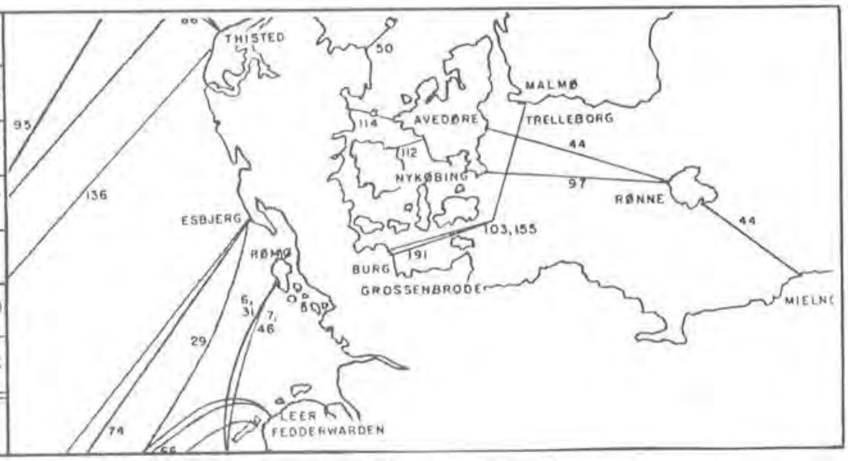
DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	7	SINGLE OR TWIN	single	SYSTEM TYPE	KS 1200

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Limited		

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state	NUMBER OF REPEATERS	1	REPEATER SPACING	-
REPEATER MANUFACTURER	Fujitsu Limited				
NOMINAL TRANSMISSION BANDWIDTH	5248+5248 kHz	TRANSMISSION FREQUENCIES	316-5564 + 7804-13052 kHz		
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-		

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1200	now	1200	CHANNEL SPACING, INITIAL	4 kHz	now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Limited			CONSTRUCTION CONTRACTOR	Fujitsu	
POWER FEED MODE	single end	NOMINAL VOLTAGE	40	SYSTEM CURRENT	0.150 A	
TASI TYPE	- CIRCUITS USED -	-CIRCUITS DERIVED -	TOTAL CIRCUITS-	DATE APPLIED	-	

COST	$ MILLION
CABLE	0.20
SUBMERGED ELECTRONICS	0.05
TERMINAL AND POWER FEED	0.17
TERMINAL STATIONS	-
INSTALLATION	0.40
TOTAL	0.82
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **191**

OFFICIAL NAME	Germany-Sweden 3		
OTHER NAMES	G - S 3		
COUNTRY A	Federal Republic of Germany	COUNTRY B	Sweden
TERMINUS A	Grossenbrode	TERMINUS B	Malmö
LANDING POINT A	Grossenbrode	LANDING POINT B	Trelleborg
COORDINATES A	$54^{\circ}23'$N x $11^{\circ}09'$E	COORDINATES B	$55^{\circ}23'$N x $13^{\circ}07'$E

OWNER A	Deutsche Bundespost	CIRCUITS HELD	1200h
OWNER B	Televerket	CIRCUITS HELD	1200h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1978	NATURE OF SERVICE	commercial	CABLE MILES	109	SINGLE OR TWIN	single	SYSTEM TYPE	KS 1200
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited			CABLESHIP USED:	NORTHERN				
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state with temperature-actuated gain control (TAGC)			NUMBER OF REPEATERS	28	REPEATER SPACING	4.0 nm		
REPEATER MANUFACTURER	Fujitsu Limited								
NOMINAL TRANSMISSION BANDWIDTH	5240+5240 kHz	TRANSMISSION FREQUENCIES	316-5564 + 7804-13052 kHz						
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	assembled on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1200	now	1200	CHANNEL SPACING, INITIAL	4 kHz	now	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd.			CONSTRUCTION CONTRACTOR	Fujitsu				
POWER FEED MODE	double end	NOMINAL VOLTAGE	275/275	SYSTEM CURRENT	0.150 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	\$ MILLION
CABLE	3.0
SUBMERGED ELECTRONICS	1.0
TERMINAL AND POWER FEED	0.3
TERMINAL STATIONS	-
INSTALLATION	0.5
TOTAL	4.8
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **192**

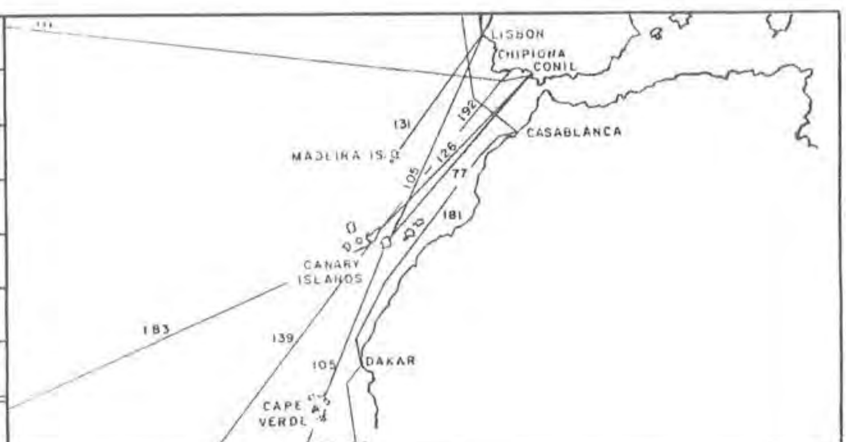
OFFICIAL NAME	Peninsula - Canary Islands No. 3	ACRONYM	PENCAN 3
OTHER NAMES	Chipiona (Cadiz) - Las Palmas de Gran Canaria		
COUNTRY A	Spain (Canary Islands)	COUNTRY B	Spain (Mainland)
TERMINUS A	Las Palmas	TERMINUS B	Chipiona, Cadiz
LANDING POINT A	San Cristóbal	LANDING POINT B	Ballena Beach
COORDINATES A	28°05'N x 15°25'W	COORDINATES B	36°40'N x 6°25'W

OWNER	Compañía Telefónica Nacional de España					CIRCUITS HELD	All	
IRU HOLDERS	DBP	CANTV	SACC	CPRM	PTT France	ITALCABLE	PTT Austria	Radio Austria
Circuits	32	1740	3	12	16	80	8	1
IRU HOLDERS	PTT Belgium	PTT Switzerland						
Circuits	4	12						

DATE IN SERVICE	1978	NATURE OF SERVICE	commercial	CABLE MILES	743	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	CABLE VENTURE
REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	270 — REPEATER SPACING 2.75 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Limited		
NOMINAL TRANSMISSION BANDWIDTH	17000+17000 kHz	TRANSMISSION FREQUENCIES	1862-18980+27220-44328 kHz
NUMBER OF EQUALIZERS	13	EQUALIZATION METHOD	assembled on board: odd numbers only- even numbers fixed
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3480 now 3480	CHANNEL SPACING, INITIAL	4 kHz now 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end — NOMINAL VOLTAGE 2450/2450	SYSTEM CURRENT	0.500 A
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS -	DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	24
SUBMERGED ELECTRONICS	20
TERMINAL AND POWER FEED	3
TERMINAL STATIONS	-
INSTALLATION	3
TOTAL	50
SYSTEM DESIGN LIFE	25 years



RETIRED 1982

SEACABLE SYSTEM DATA PROFILE

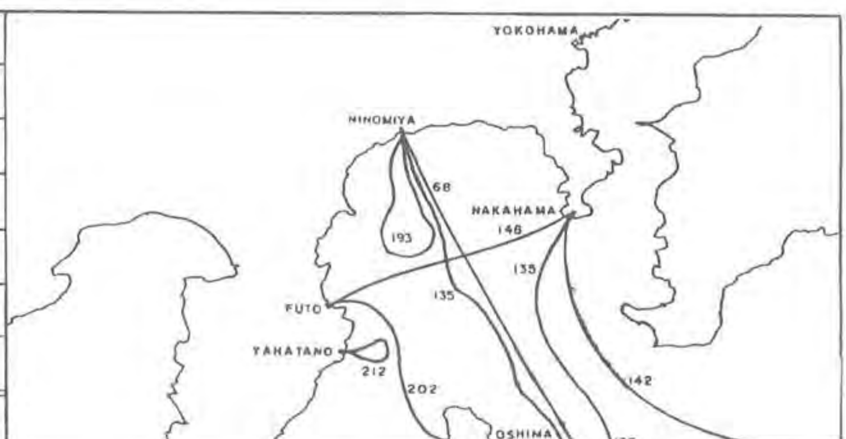
SYSTEM REFERENCE NUMBER **193**

OFFICIAL NAME	Sagami Bay 3		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Ninomiya	TERMINUS B	Ninomiya
LANDING POINT A	Ninomiya	LANDING POINT B	Ninomiya
COORDINATES A	$35^{\circ}17'$N x $139^{\circ}16'$E	COORDINATES B	$35^{\circ}17'$N x $139^{\circ}16'$E

OWNER	Ministry of Posts and Telecommunications	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1978
NATURE OF SERVICE	experimental
CABLE MILES	53
SINGLE OR TWIN	single
SYSTEM TYPE	CS 12M
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Limited
CABLESHIP USED:	KUROSHIO MARU
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state
NUMBER OF REPEATERS	8
REPEATER SPACING	6.7 nm
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited
NOMINAL TRANSMISSION BANDWIDTH	5032+5032 kHz
TRANSMISSION FREQUENCIES	564-5596 + 7356-12388 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1200
now	1200
CHANNEL SPACING, INITIAL	4 kHz
now	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu
CONSTRUCTION CONTRACTOR	NTTPC
POWER FEED MODE	single end
NOMINAL VOLTAGE	150
SYSTEM CURRENT	0.100 A
TASI TYPE - CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	2.44
SUBMERGED ELECTRONICS	0.62
TERMINAL AND POWER FEED	1.28
TERMINAL STATIONS	-
INSTALLATION	0.62
TOTAL	4.96
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

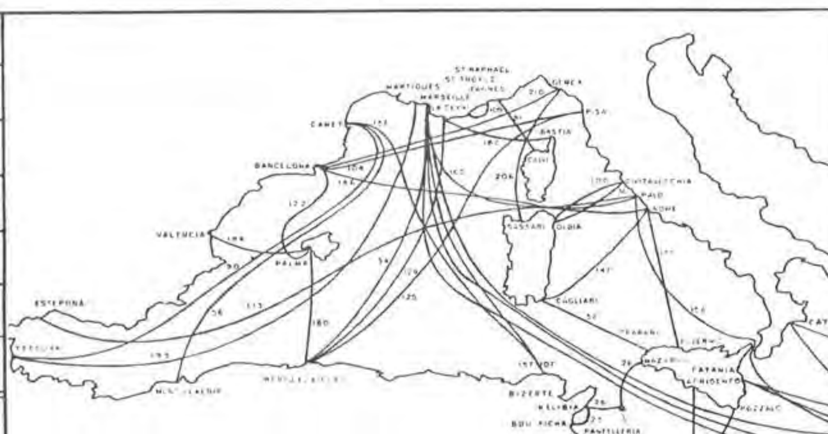
SYSTEM REFERENCE NUMBER **195**

OFFICIAL NAME	AMITIÉ		
OTHER NAMES	France-Morocco	Marseille-Tetouan	
COUNTRY A	France	COUNTRY B	Morocco
TERMINUS A	Marseille	TERMINUS B	Tetouan
LANDING POINT A	Martigues	LANDING POINT B	Martil
COORDINATES A	43°24'N x 05°03'E	COORDINATES B	35°38'N x 05°17'W

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	2340h
OWNER B	Administration of PTT	CIRCUITS HELD	2340h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1978
NATURE OF SERVICE	commercial
CABLE MILES	825
SINGLE OR TWIN	single
SYSTEM TYPE	S25
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.50" 38.1mm
CABLE MANUFACTURER	Les Câbles de Lyon CABLESHIP USED: VERCORS
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state
NUMBER OF REPEATERS	168
REPEATER SPACING	5 nm
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT ALCATEL
NOMINAL TRANSMISSION BANDWIDTH	10652+10652kHz
TRANSMISSION FREQUENCIES	812-11464 + 14576-25228 kHz
NUMBER OF EQUALIZERS	9
EQUALIZATION METHOD	remote controlled
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2340
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, NOW	2340
CHANNEL SPACING, INITIAL	4 kHz
CHANNEL SPACING, NOW	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL
CONSTRUCTION CONTRACTOR	SUBMARCOM
POWER FEED MODE	double end
NOMINAL VOLTAGE	2000/2000
SYSTEM CURRENT	0.365 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	23.2
SUBMERGED ELECTRONICS	12.3
TERMINAL AND POWER FEED	1.6
TERMINAL STATIONS	-
INSTALLATION	2.9
TOTAL	40.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **196**

OFFICIAL NAME	Philippines - Singapore	ACRONYM	PHILSIN
OTHER NAMES	ASEAN P-S		
COUNTRY A	Philippine Republic	COUNTRY B	Republic of Singapore
TERMINUS A	Currimao, Luzon	TERMINUS B	Singapore
LANDING POINT A	Currimao	LANDING POINT B	Katong
COORDINATES A	18°03'N x 120°29'E	COORDINATES B	01°18'N x 103°54'E

Owners	Eastern Telecommunications Philippines Incorporated ETPI	138h
	Telecommunications Authority of Singapore TELECOMS	414h
	Communications Authority of Thailand CAT	69h
	Jabatan Telecom Malaysia JTM	138h
	P. T. Indonesian Satellite Corporation INDOSAT	138h
	Kokusai Denshin Denwa Co. Ltd. KDD	138h
	Overseas Telecommunications Commission (Australia) OTC	69h
	Cable & Wireless Ltd. C&W	276h

DATE IN SERVICE 1978 | NATURE OF SERVICE commercial | CABLE MILES 1534 | SINGLE OR TWIN single | SYSTEM TYPE NE (14M)

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.47" 37.3 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited | CABLESHIP USED: CABLE VENTURE

REPEATER DESCRIPTION monocontainer inflexible bidirectional solid-state | NUMBER OF REPEATERS 234 | REPEATER SPACING 6.5 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 5700+5700 kHz | TRANSMISSION FREQUENCIES 312-6012 + 8000-13700 kHz

NUMBER OF EQUALIZERS 15 | EQUALIZATION METHOD assembled on board

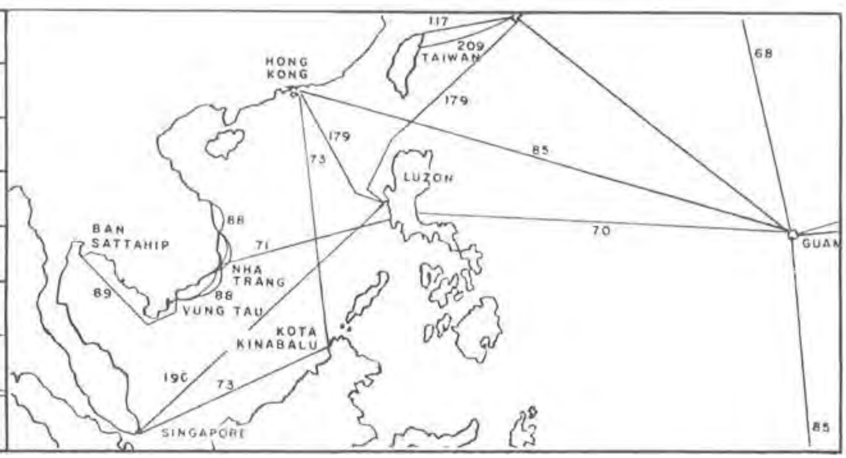
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 1380 now 1380 | CHANNEL SPACING, INITIAL 4 kHz now 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. | CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end | NOMINAL VOLTAGE 3200/3200 | SYSTEM CURRENT 0.470 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	34
SUBMERGED ELECTRONICS	17
TERMINAL AND POWER FEED	1
TERMINAL STATIONS	-
INSTALLATION	4
TOTAL	56
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

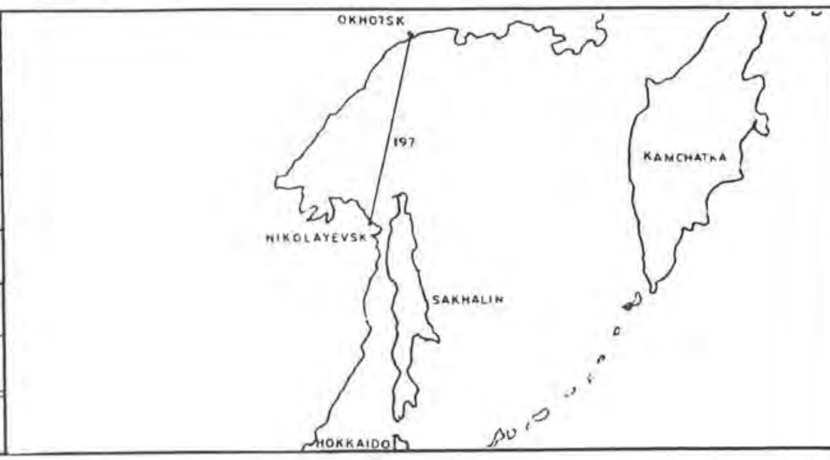
SYSTEM REFERENCE NUMBER **197**

OFFICIAL NAME	Okhotsk-Nikolayevsk		
OTHER NAMES			
COUNTRY A	U.S.S.R.	COUNTRY B	U.S.S.R.
TERMINUS A	Okhotsk	TERMINUS B	Nikolayevsk
LANDING POINT A	Okhotsk	LANDING POINT B	Nikolayevsk
COORDINATES A	59°16N x 143°20'E	COORDINATES B	53°11'N x 140°42'E

OWNER	Ministry of Posts and Telecommunications	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1979	NATURE OF SERVICE	administrative	CABLE MILES	512	SINGLE OR TWIN	single	SYSTEM TYPE	CS 5M
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited	CABLESHIP USED: INGUL							
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	63	REPEATER SPACING	8 nm		
REPEATER MANUFACTURER	Nippon Electric Company Limited								
NOMINAL TRANSMISSION BANDWIDTH	1920+1920 kHz	TRANSMISSION FREQUENCIES	280-2329 + 3060-5113 kHz						
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	adjusted on board						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI	480	CHANNEL SPACING	4 kHz						
TERMINAL EQUIPMENT MANUFACTURER	Nippon Electric Company	CONSTRUCTION CONTRACTOR	NEC supplied; USSR installed						
POWER FEED MODE	double end	NOMINAL VOLTAGE	1200/1200	SYSTEM CURRENT	0.105 A				
TASI TYPE	–	CIRCUITS USED	–	CIRCUITS DERIVED	–	TOTAL CIRCUITS	–	DATE APPLIED	–

COST	$ MILLION
CABLE	5.9
SUBMERGED ELECTRONICS	3.9
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	0.6
INSTALLATION	0.8
TOTAL	12.1
SYSTEM DESIGN LIFE	25 years



198
199
200
201 Unassigned

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **202**

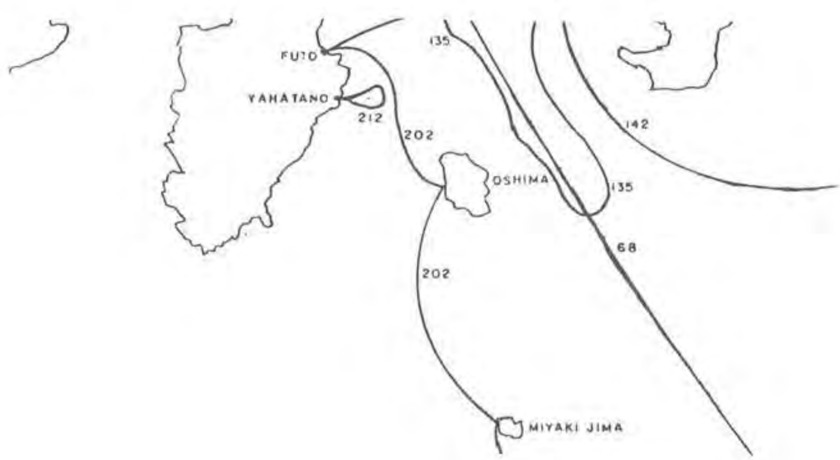
OFFICIAL NAME	Itoh - Miyake
OTHER NAMES	

COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Futo, Shizuoke	TERMINUS B	Oshima
LANDING POINT A	Futo	LANDING POINT B	Oshima
COORDINATES A	34°55'N x 139°08'E	COORDINATES B	33°44'N x 139°22'E

COUNTRY C	Japan
TERMINUS C	Miyake Jima
LANDING POINT C	Miyake Jima
COORDINATES C	34°04'N x 139°29'E

COUNTRY E		COUNTRY F	
TERMINUS E		TERMINUS F	
LANDING POINT E		LANDING POINT F	
COORDINATES E		COORDINATES F	

CABLE MILES	AB 18		B C 44		C D		D E		E F
DATE IN SERVICE	1979	NATURE OF SERVICE	commercial		SINGLE OR TWIN	single		SYSTEM TYPE	CS 36M
CABLE DESCRIPTION	unarmored polyethylene					CABLE SIZE	1.50" 38.1 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited (Japan)								



OWNER	Nippon Telegraph and Telephone Public Corporation
CIRCUITS HELD	All
I R U HOLDERS	
CIRCUITS HELD	
LESSEES	
CIRCUITS LEASED	

REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state					REPEATER SPACING 2.0 nm
NUMBER OF REPEATERS	A B 9	B C 23	C D	D E	E F	
REPEATER MANUFACTURER	Fujitsu Ltd. and Nippon Electric Company Ltd.					
NUMBER OF EQUALIZERS	A B none	B C none	C D	D E	E F	
EQUALIZATION METHOD	-					
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd. and Nippon Electric Co. Ltd.					
POWER FEED MODE	A B double end	B C double end	C D	D E	E F	
NOMINAL VOLTAGE	200/200	400/400				SYSTEM CURRENT 0.156 A
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz		TRANSMISSION FREQUENCIES	4332-17004+22796-35468kHz		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI	2700		CHANNEL SPACING	4 kHz		
TASI TYPE -	CIRCUITS USED -	CIRCUITS DERIVED -	TOTAL CIRCUITS -	DATE APPLIED -		
REMARKS			CABLESHIP USED: KUROSHIO MARU			

CONSTRUCTION CONTRACTOR	Nippon Telegraph and Telephone Public Corporation

COST	$ MILLION
CABLE	0.94
SUBMERGED ELECTRONICS	1.34
TERMINAL AND POWER FEED	0.28
TERMINAL STATIONS	0.38
INSTALLATION	0.60
TOTAL	3.54
SYSTEM DESIGN LIFE	20 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **203**

OFFICIAL NAME	U.K. - France 2
OTHER NAMES	Eastbourne-St. Valery en Caux

COUNTRY A	England	COUNTRY B	France
TERMINUS A	Eastbourne	TERMINUS B	St. Valery en Caux
LANDING POINT A	Cuckmere	LANDING POINT B	St. Valery en Caux
COORDINATES A	$50^{o}45'N \times 00^{o}16'E.$	COORDINATES B	$49^{o}52'N \times 00^{o}43'E$

OWNER A	British Post Office	CIRCUITS HELD
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD
I R U HOLDERS		
CIRCUITS HELD		
LESSEES		
CIRCUITS LEASED		

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	60	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45M)

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Ltd.	CABLESHIP USED:	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	21	REPEATER SPACING	2.75 nm

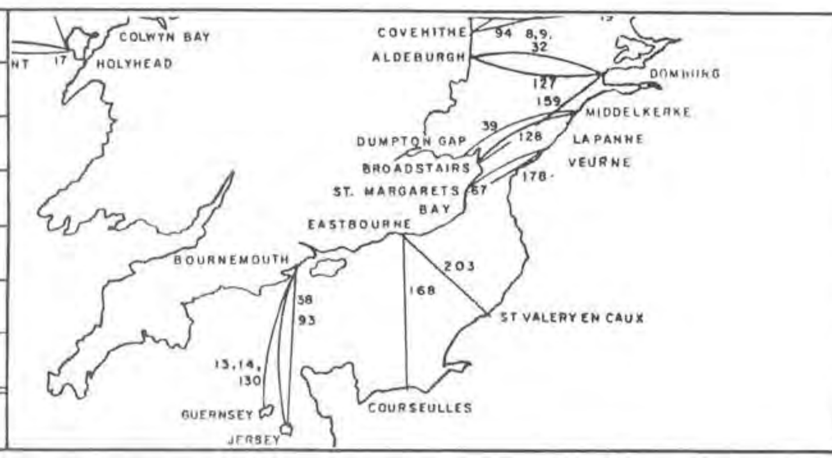
REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	17000+17000kHz	TRANSMISSION FREQUENCIES	1900-19000 + 27200-44300kHz
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3000 + 1200	CHANNEL SPACING, INITIAL	4 kHz and 3 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	300/300	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	1.59
SUBMERGED ELECTRONICS	1.27
TERMINAL AND POWER FEED	1.91
TERMINAL STATIONS	0.41
INSTALLATION	0.63
TOTAL	5.81
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

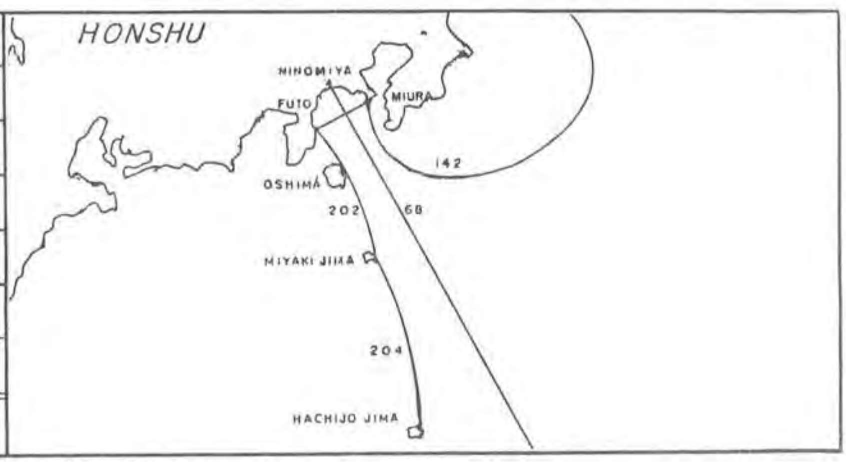
SYSTEM REFERENCE NUMBER **204**

OFFICIAL NAME	Miyake - Hachijo		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Miyake Jima	TERMINUS B	Hachijo Jima
LANDING POINT A	Miyake Jima	LANDING POINT B	Hachijo Jima
COORDINATES A	34°04'N x 139°29'E	COORDINATES B	33°08'N x 139°48'E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All
I R U H LDERS	none		
CIRCUIT HELD	-		
LESSEES	none		
CIRCUIT LEASED	-		

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	79	SINGLE OR TWIN	single	SYSTEM TYPE	CS 10M
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.50" 38.1mm		
CABLE MANUFACTURER	Ocean Cable Company Limited								
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	12	REPEATER SPACING	5.4 nm		
REPEATER MANUFACTURER	Fujitsu Limited and Nippon Electric Company Limited								
NOMINAL TRANSMISSION BANDWIDTH	3716+3716 kHz	TRANSMISSION FREQUENCIES	312-4028+5872-9588 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900	CHANNEL SPACING, INITIAL	4 kHz						
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC	CONSTRUCTION CONTRACTOR	NTTPC						
POWER FEED MODE	double end	NOMINAL VOLTAGE	200/200	SYSTEM CURRENT	0.090 A				
TASI TYPE -- CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	0.20
SUBMERGED ELECTRONICS	0.50
TERMINAL AND POWER FEED	0.08
TERMINAL STATIONS	0.08
INSTALLATION	0.39
TOTAL	1.17
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **205**

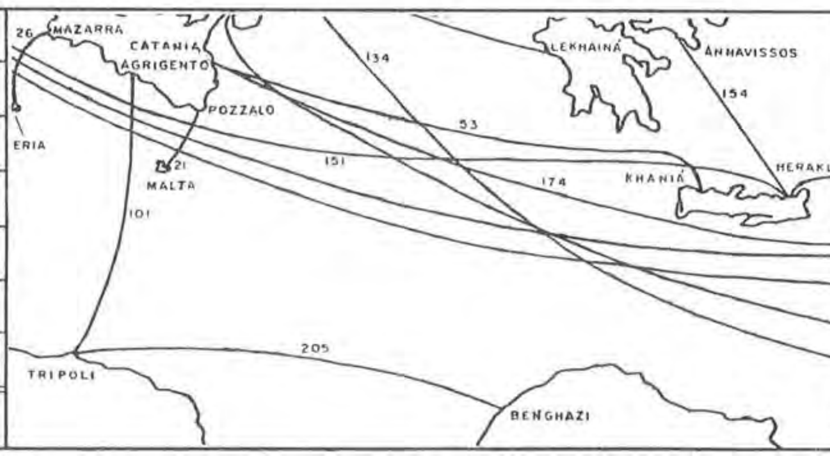
OFFICIAL NAME	Tripoli-Benghazi		
OTHER NAMES			
COUNTRY A	Libya	COUNTRY B	Libya
TERMINUS A	Tripoli	TERMINUS B	Benghazi
LANDING POINT A	Tripoli	LANDING POINT B	Brnghazi
COORDINATES A	32°58'N x 13°13'E	COORDINATES B	32°08'N x 20°01'E

OWNER	Libya Post and Telecommunication Corporation	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	382	SINGLE OR TWIN	single	SYSTEM TYPE	CS 36M

CABLE DESCRIPTION	unarmored polyethylene coaxial — CABLE SIZE 1.50' 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Limited — CABLESHIP USED: CABLE VENTURE
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state — NUMBER OF REPEATERS 130 — REPEATER SPACING 2.75 nm
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited
NOMINAL TRANSMISSION BANDWIDTH	12672+12672kHz — TRANSMISSION FREQUENCIES 4332-17004 + 22796-35468kHz
NUMBER OF EQUALIZERS	5 — EQUALIZATION METHOD magnetic external stepping
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900 + 2-way color — CHANNEL SPACING, INITIAL 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Nippon Electric Co. Ltd. & Fujitsu Ltd. — CONSTRUCTION CONTRACTOR NEC
POWER FEED MODE	double end — NOMINAL VOLTAGE 1300/1300 — SYSTEM CURRENT 0.156 A
TASI TYPE	- — CIRCUITS USED - — CIRCUITS DERIVED - — TOTAL CIRCUITS - — DATE APPLIED -

COST	$ MILLION
CABLE	23.0
SUBMERGED ELECTRONICS	16.2
TERMINAL AND POWER FEED	3.8
TERMINAL STATIONS	2.0
INSTALLATION	2.7
TOTAL	47.7
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **206**

OFFICIAL NAME	Genoa-Sassari
OTHER NAMES	Italy - Sardinia 4

COUNTRY A	Italy (mainland)	COUNTRY B	Italy (Sardinia)
TERMINUS A	Genoa	TERMINUS B	Sassari
LANDING POINT A	Punta Vagno	LANDING POINT B	Porto Torres
COORDINATES A	$44^{\circ}25'$N x $08^{\circ}57'$E	COORDINATES B	$40^{\circ}52'$N x $08^{\circ}25'$E

OWNER	Azienda di Stato per i Servizi Telefonici	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	–		
LESSEES	none		
CIRCUITS LEASED	–		

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	272	SINGLE OR TWIN	single	SYSTEM TYPE	NG (45M)

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	CABLE VENTURE

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	99	REPEATER SPACING	2.75 nm

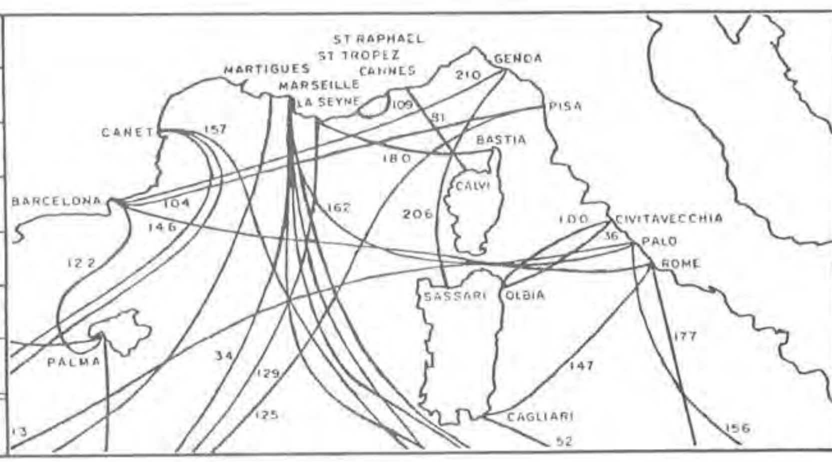
REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	17000+17000kHz	TRANSMISSION FREQUENCIES	1900-19000 + 27200-44300 kHz
NUMBER OF EQUALIZERS	4	EQUALIZATION METHOD	assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3600	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	1000/1000	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	6.3
SUBMERGED ELECTRONICS	5.3
TERMINAL AND POWER FEED	1.8
TERMINAL STATIONS	0.8
INSTALLATION	1.0
TOTAL	15.1
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **207**

OFFICIAL NAME	La Seyne - Tripoli		
OTHER NAMES	France - Libya	EL FATAH	
COUNTRY A	France	COUNTRY B	Libya
TERMINUS A	La Seyne Sur Mer	TERMINUS B	Tripoli
LANDING POINT A	Les Sablettes	LANDING POINT B	Tarabulus
COORDINATES A	43°04'N x 05°53'E	COORDINATES B	32°53'N x 13°08'E

OWNER A	Ministry of Posts and Telecommunications	CIRCUITS HELD	320 h
OWNER B	Libya Post and Telecommunication Corporation	CIRCUITS HELD	320 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE 1979 | NATURE OF SERVICE commercial | CABLE MILES 845 | SINGLE OR TWIN single | SYSTEM TYPE S 5

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.5" 38.1 mm

CABLE MANUFACTURER Les Câbles de Lyon | CABLESHIP USED: VERCORS

REPEATER DESCRIPTION monocontainer flexible bidirectional transistorized | NUMBER OF REPEATERS 90 | REPEATER SPACING 12 nm

REPEATER MANUFACTURER Compagnie Industrielle des Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH 1980 +1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 7 | EQUALIZATION METHOD computed and assembled on board

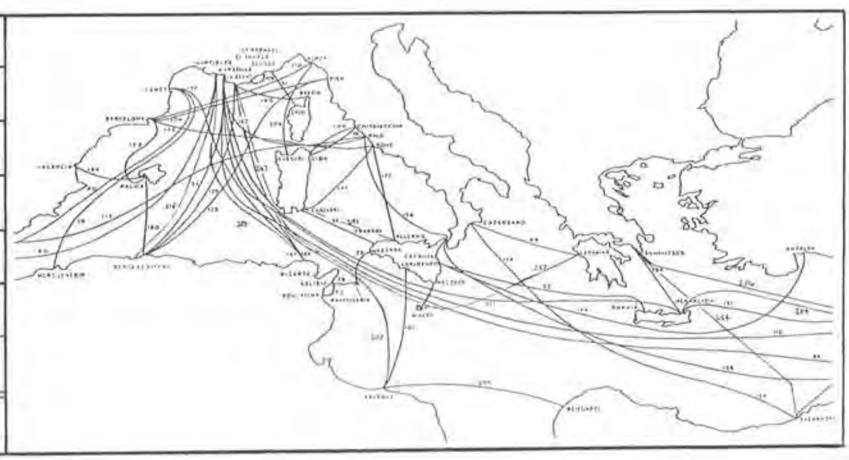
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 640 | CHANNEL SPACING, INITIAL 3 kHz

TERMINAL EQUIPMENT MANUFACTURER CIT ALCATEL | CONSTRUCTION CONTRACTOR SUBMARCOM

POWER FEED MODE double end | NOMINAL VOLTAGE | SYSTEM CURRENT 0.180 A

TASI TYPE - CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST (approximate)	$ MILLION
CABLE	10.2
SUBMERGED ELECTRONICS	10.0
TERMINAL AND POWER FEED	2.0
TERMINAL STATIONS	1.0
INSTALLATION	2.1
TOTAL	25.3
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

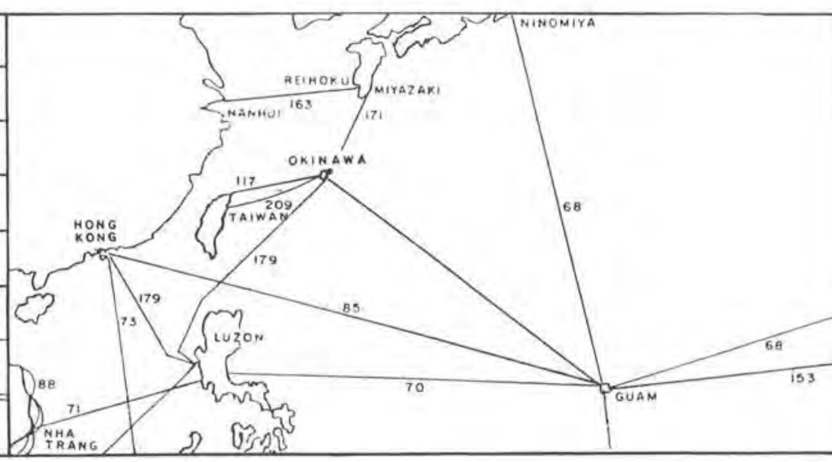
SYSTEM REFERENCE NUMBER **209**

OFFICIAL NAME	Japan-Republic of China	ACRONYM	OKITAI
OTHER NAMES	Okinawa-Taiwan		
COUNTRY A	Republic of China	COUNTRY B	Japan
TERMINUS A	Toucheng, Taiwan	TERMINUS B	Gushikami, Okinawa
LANDING POINT A	Toucheng	LANDING POINT B	Gushikami
COORDINATES A	$24^{\circ}51'$N x $121^{\circ}49'$E	COORDINATES B	$26^{\circ}07'$N x $127^{\circ}45'$E

OWNER A	Nippon Asia Submarine Cable Company Limited	CIRCUITS HELD 480 h
Owner B	International Telecommunications Development Corporation	CIRCUITS HELD 480 h

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	367	SINGLE OR TWIN	single	SYSTEM TYPE	CS 5M
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited			CABLESHIP USED: KDD MARU					
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state					NUMBER OF REPEATERS	44	REPEATER SPACING	8.3 nm
REPEATER MANUFACTURER	Nippon Electric Company Limited and Fujitsu Limited								
NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz			TRANSMISSION FREQUENCIES	312-2292+3068-5048 kHz				
NUMBER OF EQUALIZERS	1			EQUALIZATION METHOD	fixed				
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480					CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu					CONSTRUCTION CONTRACTOR	KDD		
POWER FEED MODE	double end			NOMINAL VOLTAGE	410/410	SYSTEM CURRENT	0.100 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	5.9
SUBMERGED ELECTRONICS	4.2
TERMINAL AND POWER FEED	3.2
TERMINAL STATIONS	3.2
INSTALLATION	7.5
TOTAL	24.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **210**

OFFICIAL NAME	Barcelona - Genoa	ACRONYM	BARGEN
OTHER NAMES	Spain-Italy 4		
COUNTRY A	Italy	COUNTRY B	Spain
TERMINUS A	Genoa	TERMINUS B	Cabrera de Mar
LANDING POINT A	Punta Vagno	LANDING POINT B	Cabrera Beach
COORDINATES A	$44^{\circ}23'N \times 8^{\circ}57'E$	COORDINATES B	$41^{\circ}31'N \times 2^{\circ}24'E$

OWNER B	Compania Telefónica Nacional de España	CIRCUITS HELD	4140h
OWNER A	Azienda di Stato per i Servizi Telefonici	CIRCUITS HELD	4140h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	389	SINGLE OR TWIN	single	SYSTEM TYPE	NG 1-45M

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables Limited	CABLESHIP USED:	CABLE VENTURE

REPEATER DESCRIPTION	monocontainer inflexible bidirectional solid-state	NUMBER OF REPEATERS	142	REPEATER SPACING	2.75 nm

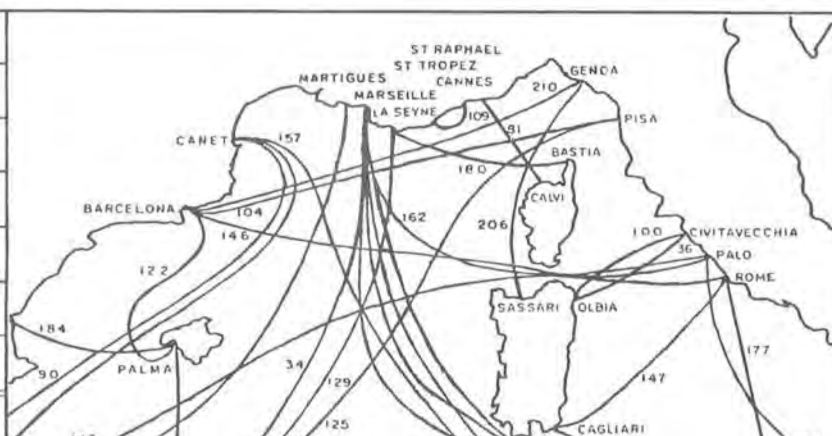
REPEATER MANUFACTURER	Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	17000+17000kHz	TRANSMISSION FREQUENCIES	1900-19004 + 27196-44300 kHz
NUMBER OF EQUALIZERS	6	EQUALIZATION METHOD	assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI	4140	CHANNEL SPACING	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	1300/1300	SYSTEM CURRENT	0.500 A

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST Estimated	$ MILLION
CABLE	8.9
SUBMERGED ELECTRONICS	7.5
TERMINAL AND POWER FEED	1.8
TERMINAL STATIONS	-
INSTALLATION	1.0
TOTAL	19.2
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

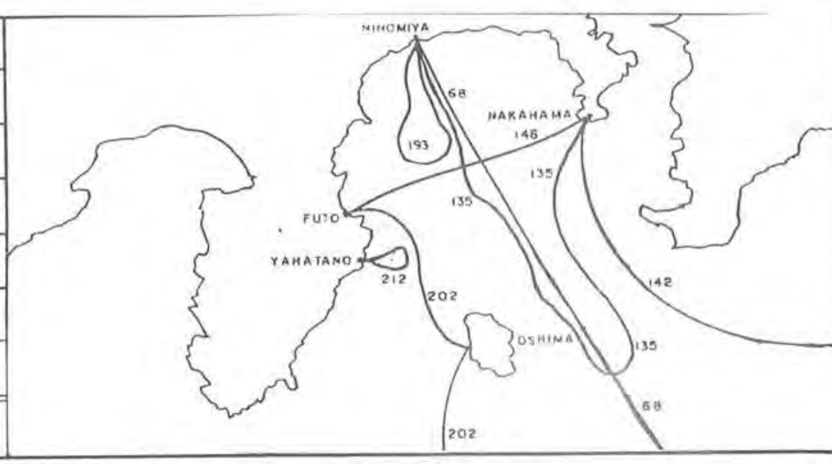
SYSTEM REFERENCE NUMBER **212**

OFFICIAL NAME	Sagami Bay No. 4		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Yahatano, Shizuoka	TERMINUS B	Yahatano, Shizuoka
LANDING POINT A	Yahatano	LANDING POINT B	Yahatano
COORDINATES A	$34^{o}53'N \times 139^{o}07'E$	COORDINATES B	same

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All
I R U HOLDERS	none		
CIRCUITS HELD	-		
LESSEES	none		
CIRCUITS LEASED	-		

DATE IN SERVICE	1979	NATURE OF SERVICE	experimental	CABLE MILES	8	SINGLE OR TWIN	single	SYSTEM TYPE	CS 140M
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.7" 43.2 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited			CABLESHIP USED: KUROSHIO MARU					
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	4	REPEATER SPACING	1.8nm		
REPEATER MANUFACTURER	Fujitsu Limited and Nippon Electric Company Limited								
NOMINAL TRANSMISSION BANDWIDTH	43.2+43.2 MHz	TRANSMISSION FREQUENCIES							
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	10,800	CHANNEL SPACING, INITIAL	4 kHz						
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC	CONSTRUCTION CONTRACTOR	NTTPC						
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT	0.350A				
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

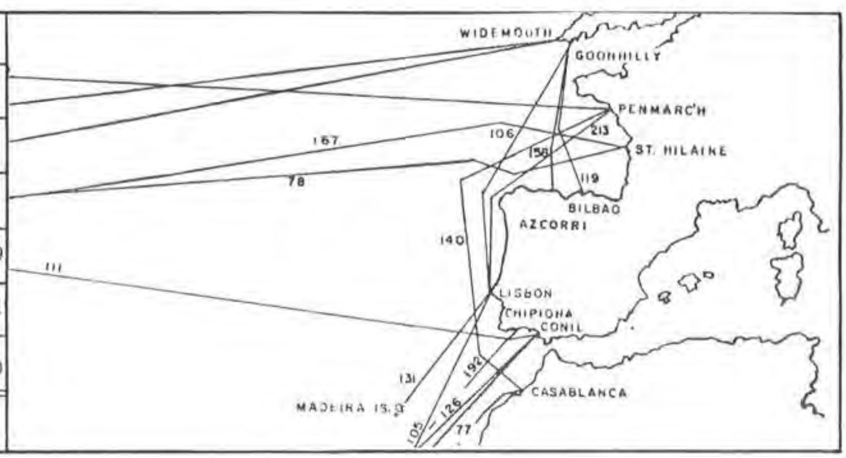
SYSTEM REFERENCE NUMBER **213**

OFFICIAL NAME	Portugal-France		
OTHER NAMES	Sesimbra - Penmarc'h	TAGIDE	
COUNTRY A	Portugal	COUNTRY B	France
TERMINUS A	Sesimbra	TERMINUS B	Penmarc'h
LANDING POINT A	Praia Nova do Moinho de Baixo	LANDING POINT B	Penmarc'h
COORDINATES A	$38^{\circ}29'N \times 09^{\circ}11'W$	COORDINATES B	$47^{\circ}50'N \times 04^{\circ}21'W$

OWNER A	Companhia Portuguesa Rádio Marconi	CIRCUITS HELD	2580h
OWNER B	Direction Generale des Télécommunications	CIRCUITS HELD	2580h
I R U HOLDERS	FTCC		
CIRCUITS HELD	4		
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	802	SINGLE OR TWIN	single	SYSTEM TYPE	S 25
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.70" 43.2 mm		
CABLE MANUFACTURER	Les Cables de Lyon	CABLESHIP USED:	VERCORS						
REPEATER DESCRIPTION	monocontainer flexible bidirectional solid-state			NUMBER OF REPEATERS	165	REPEATER SPACING	5 nm		
REPEATER MANUFACTURER	Compagnie Industrielle de Télécommunications CIT ALCATEL								
NOMINAL TRANSMISSION BANDWIDTH	10652+10652kHz	TRANSMISSION FREQUENCIES	812-11464 + 14576-25228 kHz						
NUMBER OF EQUALIZERS	9	EQUALIZATION METHOD	remote controlled						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2580	CHANNEL SPACING, INITIAL	4 kHz						
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM						
POWER FEED MODE	double end	NOMINAL VOLTAGE	1400/1400	SYSTEM CURRENT	0.365 A				
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	27
SUBMERGED ELECTRONICS	24
TERMINAL AND POWER FEED	3
TERMINAL STATIONS	0.9
INSTALLATION	1.1
TOTAL	56.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **214**

OFFICIAL NAME	U. K. - Netherlands 10		
OTHER NAMES	Lowestoft-Alkmaar	Lowestoft - Egmond	
COUNTRY A	England	COUNTRY B	Netherlands
TERMINUS A	Lowestoft, Suffolk	TERMINUS B	Alkmaar
LANDING POINT A	Lowestoft	LANDING POINT B	Egmond aan Zee
COORDINATES A	52°29'N x 01°45'E	COORDINATES B	52°38'N x 04°37'E

OWNER A	British Post Office	CIRCUITS HELD 3900h
Other Owners	Administration of PTT, Netherlands	900h
	Régie des T et des T, Belgium	1200h
	Deutsche Bundespost	1800h

DATE IN SERVICE	1979	NATURE OF SERVICE	commercial	CABLE MILES	119	SINGLE OR TWIN	single	SYSTEM TYPE	NG 1 45M

CABLE DESCRIPTION armored polyethylene coaxial — CABLE SIZE 1.47" 37.3 mm

CABLE MANUFACTURER Standard Telephones & Cables Limited — CABLESHIP USED: ALERT (4)

REPEATER DESCRIPTION monocontainer inflexible bidirectional solid-state — NUMBER OF REPEATERS 43 — REPEATER SPACING 2.75 nm

REPEATER MANUFACTURER Standard Telephones & Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 17000+17000kHz — TRANSMISSION FREQUENCIES 1900-19000 + 27200-44300 kHz

NUMBER OF EQUALIZERS 1 — EQUALIZATION METHOD assembled on board

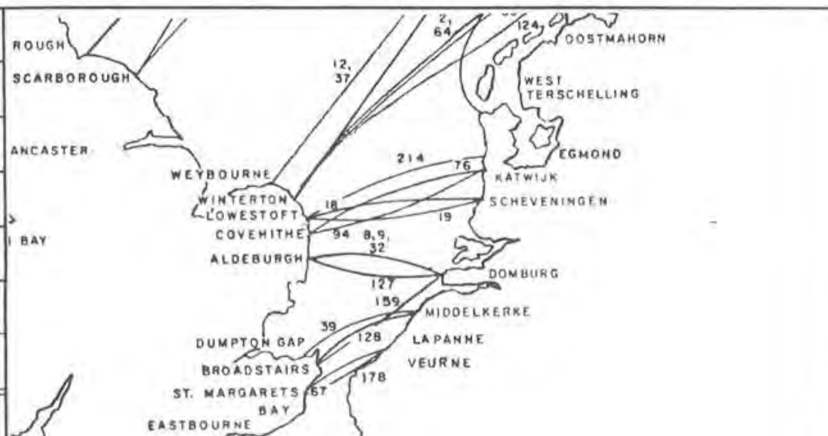
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 3900 — CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. — CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end — NOMINAL VOLTAGE 510/510 — SYSTEM CURRENT 0.500 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - - DATE APPLIED -

COST	$ MILLION
CABLE	3.2
SUBMERGED ELECTRONICS	2.0
TERMINAL AND POWER FEED	1.5
TERMINAL STATIONS	0.3
INSTALLATION	0.5
TOTAL	7.7
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **215**

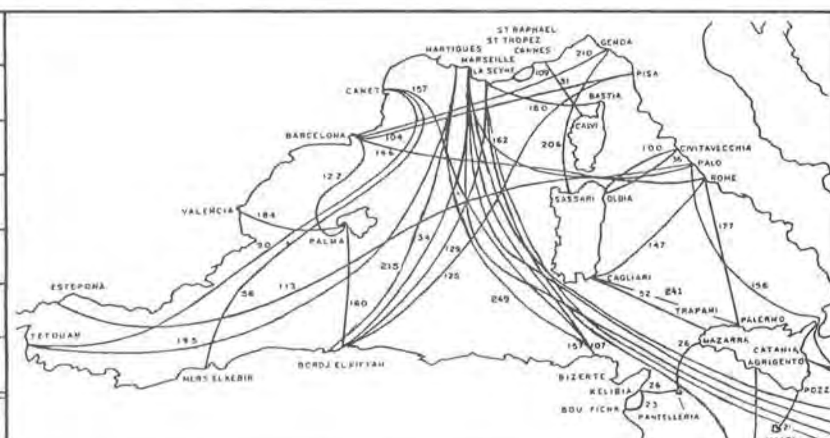
OFFICIAL NAME	France - Algeria 4	ACRONYM	
OTHER NAMES			
COUNTRY A	France	COUNTRY B	Algeria
TERMINUS A	Martigues	TERMINUS B	El Djemila
LANDING POINT A	Martigues	LANDING POINT B	El Djemila
COORDINATES A	43°24'N x 05°03'E	COORDINATES B	36°46' N x 2°53' E

OWNER A	Administration of Posts and Telecommunications	CIRCUITS HELD	2580 h
OWNER B	Administration of Posts and Telecommunications	CIRCUITS HELD	2580 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1980	NATURE OF SERVICE	Commercial	CABLE MILES	442	SINGLE OR TWIN	single	SYSTEM TYPE	S 25

- CABLE DESCRIPTION: unarmored polyethylene coaxial — CABLE SIZE: 1.7"
- CABLE MANUFACTURER: Les Cables de Lyon — CABLESHIP USED: VERCORS
- REPEATER DESCRIPTION: monocontainer flexible bi-directional — NUMBER OF REPEATERS: 90 — REPEATER SPACING: 5 nm
- REPEATER MANUFACTURER: Cie. Industrielle de Télélecommunications CIT ALCATEL
- NOMINAL TRANSMISSION BANDWIDTH: 10652+10652kHz — TRANSMISSION FREQUENCIES: 812-11464+14575-25228 kHz
- NUMBER OF EQUALIZERS: 5 — EQUALIZATION METHOD: Remote controlled
- NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 2580 — CHANNEL SPACING, INITIAL: 4 kHz
- TERMINAL EQUIPMENT MANUFACTURER: CIT - ALCATEL — CONSTRUCTION CONTRACTOR: SUBMARCOM
- POWER FEED MODE: double end — NOMINAL VOLTAGE: 1700/1700 — SYSTEM CURRENT: 0.365 A
- TASI TYPE - CIRCUITS USED: - — CIRCUITS DERIVED: - — TOTAL CIRCUITS: - — DATE APPLIED: -

COST (approximate)	$ MILLION
CABLE	14.518
SUBMERGED ELECTRONICS	14.783
TERMINAL AND POWER FEED	1.933
TERMINAL STATIONS	0.800
INSTALLATION	0.170
TOTAL	32.204
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

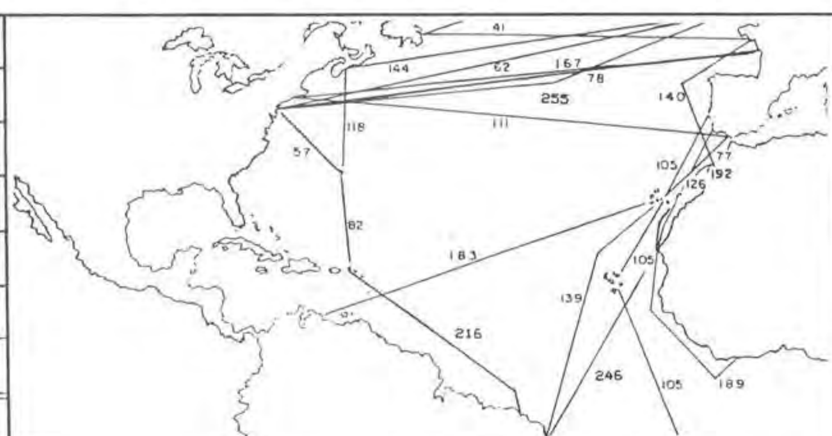
SYSTEM REFERENCE NUMBER **216**

OFFICIAL NAME	Brazil - United States	ACRONYM	BRUS
OTHER NAMES	Fortaleza - St. Thomas		
COUNTRY A	Brazil	COUNTRY B	United States (Virgin Is.)
TERMINUS A	Fortaleza, Ceará	TERMINUS B	Magens Bay, St. Thomas
LANDING POINT A	Futuro Beach	LANDING POINT B	Magens Bay
COORDINATES A	$03^{\circ}44'$S x $38^{\circ}27'$W	COORDINATES B	$18^{\circ}22'$N x $64^{\circ}56'$W

OWNER A	Empresa Brasileira de Telecomunicaçoes	CIRCUITS HELD	640 h
OWNER B	American Telephone and Telegraph Company	CIRCUITS HELD	640 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1980
NATURE OF SERVICE	commercial
CABLE MILES	2256
SINGLE OR TWIN	single
SYSTEM TYPE	SF
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	ITT Cable/Hydrospace Division
CABLE SHIP(S)	LONG LINES
REPEATER DESCRIPTION	monocontainer bidirectional flexible
NUMBER OF REPEATERS	235
REPEATER SPACING	10 nm
REPEATER MANUFACTURER	Western Electric Company
NOMINAL TRANSMISSION BANDWIDTH	2160+2160 kHz
TRANSMISSION FREQUENCIES	554-2920+3575-5984 kHz
NUMBER OF EQUALIZERS	7
EQUALIZATION METHOD	switched networks
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	640
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company
CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end
NOMINAL VOLTAGE	2250/2250
SYSTEM CURRENT	0.136 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	27.7
SUBMERGED ELECTRONICS	21.2
TERMINAL AND POWER FEED	1.0
TERMINAL STATIONS	0.3
INSTALLATION	3.3
TOTAL	53.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **217**

OFFICIAL NAME	U. S. - Venezuela 2		
OTHER NAMES	St. Thomas - Venezuela 2	VENEZ 2	
COUNTRY A	U.S.A. (Virgin Islands)	COUNTRY B	Venezuela
TERMINUS A	Magens Bay, St. Thomas	TERMINUS B	Camuri
LANDING POINT A	Magens Bay	LANDING POINT B	Camuri Chico
COORDINATES A	$18^{\circ}22'$ N x $64^{\circ}56'$ W	COORDINATES B	$10^{\circ}37'$ N x $66^{\circ}53'$ W

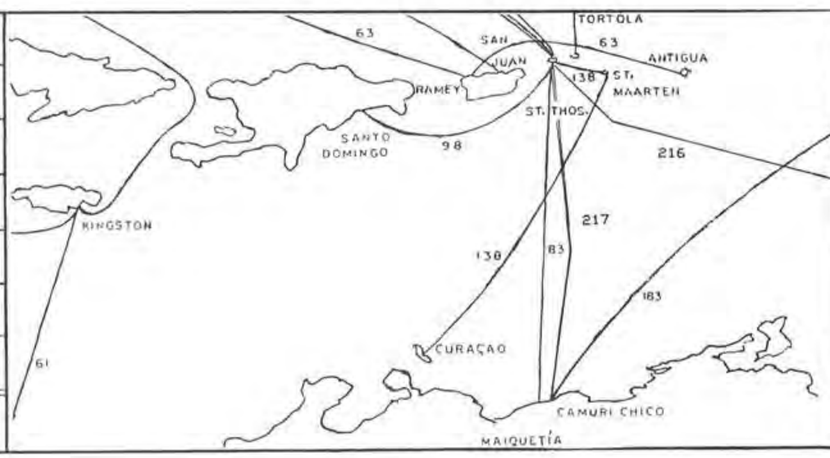
OWNER A	American Telephone and Telegraph Company	CIRCUITS HELD	640 h
OWNER B	Companía Anónima Nacional de Teléfonos de Venezuela	CIRCUITS HELD	640 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1980	NATURE OF SERVICE	commercial	CABLE MILES	560	SINGLE OR TWIN	single	SYSTEM TYPE	SF

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	ITT Cable/Hydrospace Division	CABLESHIP(S) USED	LONG LINES
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	60
REPEATER SPACING	10 nm		
REPEATER MANUFACTURER	Western Electric Company		
NOMINAL TRANSMISSION BANDWIDTH	2160+2160 kHz	TRANSMISSION FREQUENCIES	554-2920+3575-5894 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	switched networks
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	640	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT
POWER FEED MODE	double end	NOMINAL VOLTAGE	550/550
SYSTEM CURRENT	0.136 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	7.2
SUBMERGED ELECTRONICS	5.4
TERMINAL AND POWER FEED	0.9
TERMINAL STATIONS	-
INSTALLATION	1.2
TOTAL	14.7
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **218**

OFFICIAL NAME	Imabari - Hakata		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Sakurai	TERMINUS B	Hakata
LANDING POINT A	Sakurai, Imabari, Ehime	LANDING POINT B	Kinoura, Hakata Jima, Ehime
COORDINATES A	$34^{\circ}02'$N x $133^{\circ}02'$E	COORDINATES B	$34^{\circ}12'$N x $133^{\circ}06'$E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	16	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36M-S		
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4mm				
CABLE MANUFACTURER	Ocean Cable Company Ltd. CABLESHIP USED: TSUGARU MARU										
REPEATER DESCRIPTION	monocontainer flexible bidirectional					NUMBER OF REPEATERS	8	REPEATER SPACING	2 nm		
REPEATER MANUFACTURERS	Nippon Electric Company Limited and Fujitsu Limited										
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35468 kHz								
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-								
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	CHANNEL SPACING, INITIAL	4 kHz								
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd.	CONSTRUCTION CONTRACTOR	NTTPC								
POWER FEED MODE	double end	NOMINAL VOLTAGE	200/200	SYSTEM CURRENT	0.156 A						
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **219**

OFFICIAL NAME	Kushikino - Nakakoshiki		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Kushikino	TERMINUS B	Nakakoshiki
LANDING POINT A	Kushikino, Kagoshima	LANDING POINT B	Kamikoshiki Jima, Kagoshima
COORDINATES A	31°43'N x 130°16'E	COORDINATES B	31°50'N x 139°51'E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1980	NATURE OF SERVICE	commercial	CABLE MILES	29	SINGLE OR TWIN	single	SYSTEM TYPE	CS-10M		
CABLE DESCRIPTION	unarmored polyethylene coaxial							CABLE SIZE	1.0" 25.4 mm		
CABLE MANUFACTURER	Ocean Cable Company Limited					CABLESHIPS USED:	KUROSHIO MARU TSUGARU MARU				
REPEATER DESCRIPTION	monocontainer flexible bidirectional					NUMBER OF REPEATERS	5	REPEATER SPACING	5.4 nm		
REPEATER MANUFACTURERs	Fujitsu Limited and Nippon Electric Company Limited										
NOMINAL TRANSMISSION BANDWIDTH	3600+3600 kHz	TRANSMISSION FREQUENCIES	312-4028+5872-9588 kHz								
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD	-								
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900	CHANNEL SPACING, INITIAL	4 kHz								
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu	CONSTRUCTION CONTRACTOR	NTTPC								
POWER FEED MODE	double end	NOMINAL VOLTAGE	100/100	SYSTEM CURRENT	0.09 A						
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **220**

OFFICIAL NAME	Taiwan - Luzon	ACRONYM	TAILU
OTHER NAMES	Republic of China - Philippine Republic		
COUNTRY A	Republic of China	COUNTRY B	Republic of the Philippines
TERMINUS A	Toucheng	TERMINUS B	Currimao, Luzon
LANDING POINT A	Toucheng	LANDING POINT B	Currimao
COORDINATES A	24°51'N x 121°49'E	COORDINATES B	18°03'N x 120°29'E

OWNER A	International Telecommunications Administration	CIRCUITS HELD	624 h
OWNER B	Eastern Telecommunications Philippines Inc.	CIRCUITS HELD	336 h

DATE IN SERVICE 1980 | NATURE OF SERVICE commercial | CABLE MILES 557 | SINGLE OR TWIN single | SYSTEM TYPE NC

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 0.99" 25.1 mm

CABLE MANUFACTURER Standard Telephones and Cables Limited | CABLESHIP(S) USED RECORDER and CABLE VENTURE

REPEATER DESCRIPTION monocontainer inflexible bidirectional | NUMBER OF REPEATERS 71 | REPEATER SPACING 7.8 nm

REPEATER MANUFACTURER Standard Telephones and Cables Limited

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz | TRANSMISSION FREQUENCIES 312-2292+2792-4772 kHz

NUMBER OF EQUALIZERS 4 | EQUALIZATION METHOD adjusted on board

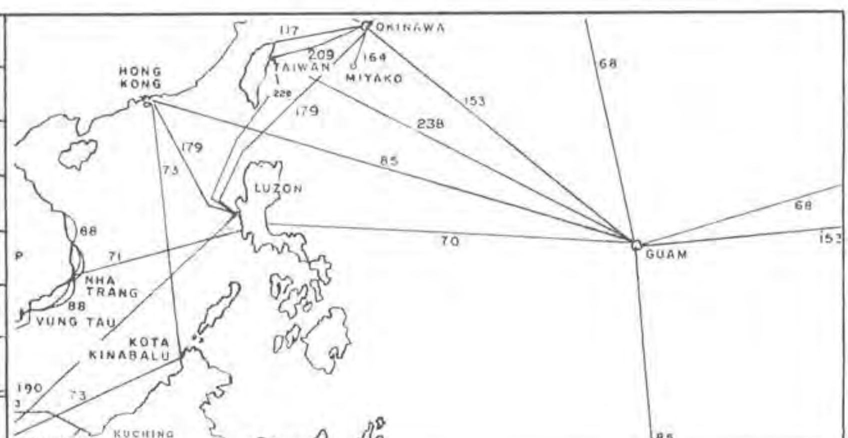
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 | CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables Ltd. | CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end | NOMINAL VOLTAGE 955/955 | SYSTEM CURRENT 0.150 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED -- | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	10.1
SUBMERGED ELECTRONICS	6.7
TERMINAL AND POWER FEED	1.9
TERMINAL STATIONS	0.7
INSTALLATION	9.6
TOTAL	29.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **221**

OFFICIAL NAME	U.K. - Denmark 3		
OTHER NAMES			
COUNTRY A	Great Britain	COUNTRY B	Denmark
TERMINUS A	Winterton	TERMINUS B	Rømø
LANDING POINT A	Winterton	LANDING POINT B	Rømø
COORDINATES A	52°43'N x 01°41'E	COORDINATES B	55°10'N x 8°30'E

OWNER A	British Telecom International	3900 h
Other Owners	The Telecommunications Administrations of	
	Denmark, Norway, Sweden, and Finland	
	1320 h 1380 h 1020 h 180 h	

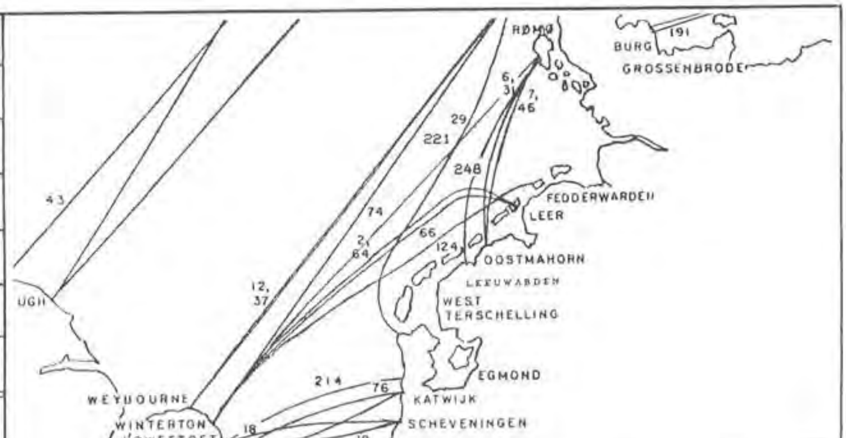
DATE IN SERVICE	1980	NATURE OF SERVICE	commercial	CABLE MILES	301	SINGLE OR TWIN	single	SYSTEM TYPE	NG

CABLE DESCRIPTION	armored polyethylene coaxial	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones and Cables Limited	CABLESHIP(S) USED	ALERT(4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	105	REPEATER SPACING	2.9 nm
REPEATER MANUFACTURER	Standard Telephones & Cables Ltd.				
NOMINAL TRANSMISSION BANDWIDTH	17000+17000 kHz	TRANSMISSION FREQUENCIES	1916-18988+27212-44284 kHz		
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	adjusted on board		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	3900	CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	2500/2500	SYSTEM CURRENT	0.500 A

TASI TYPE -- CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST (approximate)	$ MILLION
CABLE	12.5
SUBMERGED ELECTRONICS	12.5
TERMINAL AND POWER FEED	2.0
TERMINAL STATIONS	-
INSTALLATION	1.0
TOTAL	28.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **222**

OFFICIAL NAME	Indonesia - Singapore		
OTHER NAMES	ASEAN I-S		
COUNTRY B	Republic of Indonesia	COUNTRY A	Republic of Singapore
TERMINUS B	Jakarta	TERMINUS A	Katong (Singapore)
LANDING POINT B	Ancol	LANDING POINT A	Katong
COORDINATES B	$06^{o}07'S \times 106^{o}49'E$	COORDINATES A	$01^{o}18'n \times 103^{o}54'E$

OWNER	PT Indonesian Satellite Corporation				CIRCUITS HELD	480h
OWNER	Telecommunications Authority of Singapore TELECOMS				CIRCUITS HELD	210h
OTHER OWNERS	CAT	JTM	ETPI	KDD	OTC	C&W(HK)
CIRCUITS HELD	19h	28h	19h	96h	48h	60h

DATE IN SERVICE	1980	NATURE OF SERVICE	Commercial	CABLE MILES	569	SINGLE OR TWIN	single	SYSTEM TYPE	CS-5M

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.0" 25.4mm

CABLE MANUFACTURER Ocean Cable Company Limited — CABLESHIP(S) USED CHOSUI MARU, KUROSHIO MARU

REPEATER DESCRIPTION monocontainer flexible bidirectional — NUMBER OF REPEATERS 71 — REPEATER SPACING 8.1nm

REPEATER MANUFACTURERs NEC Corporation and Fujitsu Ltd.

NOMINAL TRANSMISSION BANDWIDTH 1980+1980 kHz — TRANSMISSION FREQUENCIES 312-2292+3068-5048 kHz

NUMBER OF EQUALIZERS 3 — EQUALIZATION METHOD assembled on board

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 480 — CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Fujitsu and NEC Corp. — CONSTRUCTION CONTRACTOR NEC

POWER FEED MODE double end — NOMINAL VOLTAGE 800/800 — SYSTEM CURRENT 0.1 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST (approximate)	$ MILLION
CABLE	7.8
SUBMERGED ELECTRONICS	6.9
TERMINAL AND POWER FEED	5.4
TERMINAL STATIONS	1.4
INSTALLATION	10.5
TOTAL	32.0
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **223**

OFFICIAL NAME	Kuantan - Kuching		
OTHER NAMES			
COUNTRY A	Malaysia	COUNTRY B	Malaysia
TERMINUS A	Kuantan	TERMINUS B	Kuching
LANDING POINT A	Cherating	LANDING POINT B	Sematan
COORDINATES A	$04^{\circ}06'$N x $103^{\circ}23'$E	COORDINATES B	$01^{\circ}49'$N x $109^{\circ}46'$E

OWNER	Jabatan Telekom Malaysia	CIRCUITS HELD	all

DATE IN SERVICE 1980 — NATURE OF SERVICE commercial — CABLE MILES 405 — SINGLE OR TWIN single — SYSTEM TYPE CS-12M

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.5" 38.1 mm

CABLE MANUFACTURER Ocean Cable Company Limited — CABLESHIP USED: KDD MARU

REPEATER DESCRIPTION monocontainer flexible bidirectional — NUMBER OF REPEATERS 70 — REPEATER SPACING 6.8 nm

REPEATER MANUFACTURERS NEC Corporation and Fujitsu Ltd.

NOMINAL TRANSMISSION BANDWIDTH 4952+4952 kHz — TRANSMISSION FREQUENCIES 564-5516+7436-12388 kHz

NUMBER OF EQUALIZERS 3 — EQUALIZATION METHOD assembled on board

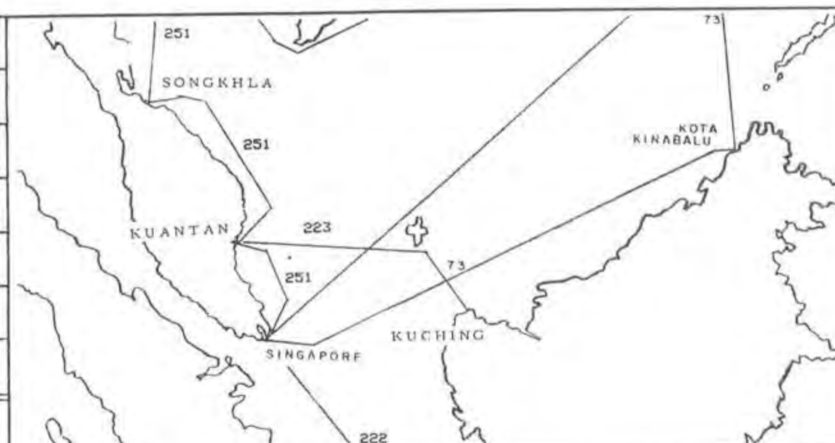
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 900 — CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Fujitsu Ltd. and NEC Corp. — CONSTRUCTION CONTRACTOR NEC

POWER FEED MODE double end — NOMINAL VOLTAGE 700/700 — SYSTEM CURRENT 0.1 A

TASI TYPE - CIRCUITS USED- - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	9.3
SUBMERGED ELECTRONICS	6.2
TERMINAL AND POWER FEED	2.6
TERMINAL STATIONS	1.7
INSTALLATION	6.7
TOTAL	26.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **224**

OFFICIAL NAME	Nagasaki - Fukue		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Kakidomari	TERMINUS B	Fukue
LANDING POINT A	Kakidomari, Nagasaki	LANDING POINT B	Roppo, Fukue, Nagasaki
COORDINATES A	32°44' N x 129°53' E	COORDINATES B	32°42' N x 128°51 E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	52	SINGLE OR TWIN	single	SYSTEM TYPE	CS - 36M-S
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4mm		
CABLE MANUFACTURER	Ocean Cable Company Ltd.			CABLESHIP USED:	KUROSHIO MARU				
REPEATER DESCRIPTION	monocontainer flexible bidirectional			NUMBER OF REPEATERS	26	REPEATER SPACING	2 nm		
REPEATER MANUFACTURERs	Nippon Electric Company Ltd. and Fujitsu Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35468 kHz						
NUMBER OF EQUALIZERS	none	EQUALIZATION METHOD							
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	CHANNEL SPACING, INITIAL	4 kHz						
TERMINAL EQUIPMENT MANUFACTURERs	Fujitsu and NEC	CONSTRUCTION CONTRACTOR	NTTPC						
POWER FEED MODE	double end	NOMINAL VOLTAGE	500/500	SYSTEM CURRENT	0.156 A				
TASI TYPE -- CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-		

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years

SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **225**

OFFICIAL NAME	Loch Fyne Sea Trial
OTHER NAMES	
COUNTRY	Scotland, U.K.
TERMINUS	Loch Fyne
LANDING POINT	Loch Fyne

OWNER	British Telecom International	CIRCUITS HELD
		CIRCUITS HELD

DATE IN SERVICE: 1980 — NATURE OF SERVICE: experimental — CABLE MILES: 5 — SYSTEM TYPE DESIGNATION:

CABLE DESCRIPTION: Four multi-mode and 2 single-mode pairs

CABLE O. D.:

CABLE MANUFACTURER: Standard Telephones & Cables PLC — CABLESHIP(S) UTILIZED: IRIS (3)

NUMBER OF REGENERATORS: 1 — REGENERATOR TYPE DESIGNATION: — REGENERATOR SPACING: -

REGENERATOR DESCRIPTION: — REGENERATOR MANUFACTURER: Standard Telephones & Cables PLC

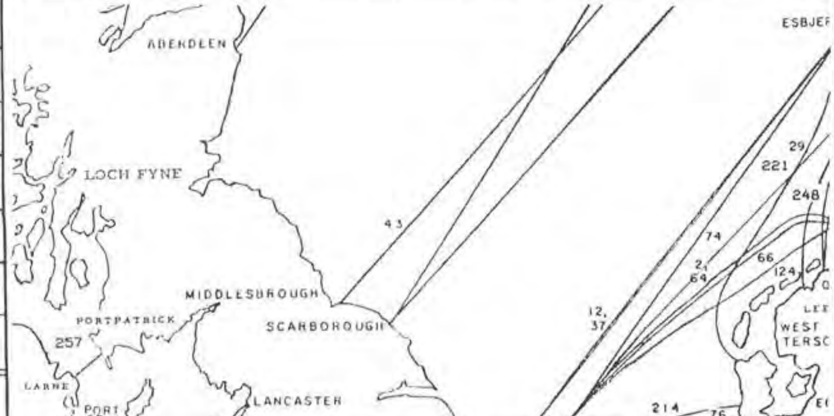
TERMINAL EQUIPMENT MANUFACTURER: Standard Telephones & Cables PLC

NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: — NOMINAL CHANNEL SPACING, INITIAL:

TRANSMISSION WAVELENGTH: 1.3 — TRANSMISSION BIT-RATE: 140 Mb/s — CONSTRUCTION CONTRACTOR: Jointly; BTI and STC

POWER FEED MODE: — NOMINAL VOLTAGE: — SYSTEM CURRENT:

COST EXPERIMENTAL	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SPECIAL FORMAT FOR FIBER OPTIC SYSTEMS

REMOVED 1983

SEACABLE SYSTEM DATA PROFILE

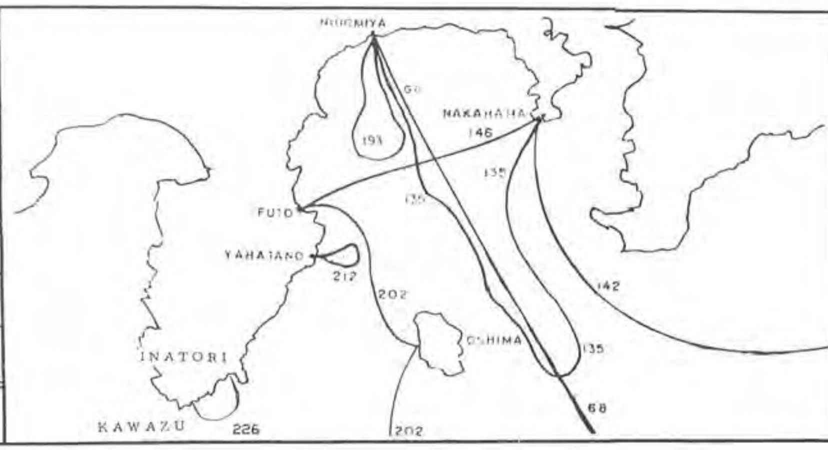
SYSTEM REFERENCE NUMBER **226**

OFFICIAL NAME	Inatori - Kawazu	ACRONYM	
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Inatori	TERMINUS B	Kawazu
LANDING POINT A	Inatori	LANDING POINT B	Kawazu
COORDINATES A	$34^{o}46'$ N x $139^{o}04'$ E	COORDINATES B	$34^{o}45'$ N x $139^{o}00'$ E

OWNER	Nippon Telegraph and Telephone Public Corporation
	50 km tests obtained by looping back at the terminals; tests conducted at
	6.3, 32, and 100 Mb/s

DATE IN SERVICE	1980	NATURE OF SERVICE	experimental	CABLE MILES	5.5	SYSTEM TYPE DESIGNATION	FS - 6.3M
CABLE DESCRIPTION	5 graded-index multimode fibers enclosed in a metal tube						
						CABLE O. D.	
CABLE MANUFACTURER	Ocean Cable Company Ltd.			CABLESHIP(S) UTILIZED	TSUGARU MARU		
NUMBER OF REGENERATORS	none	REGENERATOR TYPE DESIGNATION	-			REGENERATOR SPACING	-
REGENERATOR DESCRIPTION	-			REGENERATOR MANUFACTURER	-		
TERMINAL EQUIPMENT MANUFACTURERS	Fujitsu Ltd. and NEC Corp.						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1440			NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	$1.3\mu m$	TRANSMISSION BIT-RATE	6.3Mb/s	CONSTRUCTION CONTRACTOR	NTTPC		
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT			
TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	EXPERIMENTAL $ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **227**

OFFICIAL NAME	Takehara - Kinoe		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Nagahama	TERMINUS B	Higashino
LANDING POINT A	Tadanoumi, Takehara, Hiroshima	LANDING POINT B	Higashino, Osakikamishima
COORDINATES A	34°20' N x 132°59' E	COORDINATES B	34°16' N x 132°57' E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	5	SINGLE OR TWIN	single	SYSTEM TYPE	CS - 36M-S

CABLE DESCRIPTION	unarmored polyethylene coaxial — CABLE SIZE 1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Limited — CABLESHIP USED: TSUGARU MARU
REPEATER DESCRIPTION	monocontainer flexible bidirectional — NUMBER OF REPEATERS 2 — REPEATER SPACING 2.01 nm
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz — TRANSMISSION FREQUENCIES 4332-17004+22796-35469 kHz
NUMBER OF EQUALIZERS	none — EQUALIZATION METHOD -
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700 — CHANNEL SPACING, INITIAL 4kHz
TERMINAL EQUIPMENT MANUFACTURER	Nippon Electric Co. Ltd. — CONSTRUCTION CONTRACTOR NTTPC
POWER FEED MODE	double end — NOMINAL VOLTAGE 100/100 — SYSTEM CURRENT 0.156 A
TASI TYPE	- CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **228**

OFFICIAL NAME	Nase - Tokunoshima		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Nase	TERMINUS B	Tokunoshima
LANDING POINT A	Nase, Amamioshima	LANDING POINT B	Tokunoshima
COORDINATES A	$28^{o}22'$ N x $129^{o}18'$ E	COORDINATES B	$27^{o}44'$ N x $128^{o}55'$ E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	65	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36M-S

CABLE DESCRIPTION: unarmored polyethylene coaxial — CABLE SIZE: 1.00" 25.4 mm / 1.50" 38.1 mm

CABLE MANUFACTURER: Ocean Cable Company Limited — CABLESHIP USED: TSUGARU MARU

REPEATER DESCRIPTION: monocontainer flexible bidirectional — NUMBER OF REPEATERS: 27 — REPEATER SPACING: 2.92 nm

REPEATER MANUFACTURERS: Fujitsu Limited and Nippon Electric Company Limited

NOMINAL TRANSMISSION BANDWIDTH: 12672+12672 kHz — TRANSMISSION FREQUENCIES: 4332-17004+22796-35468 kHz

NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -

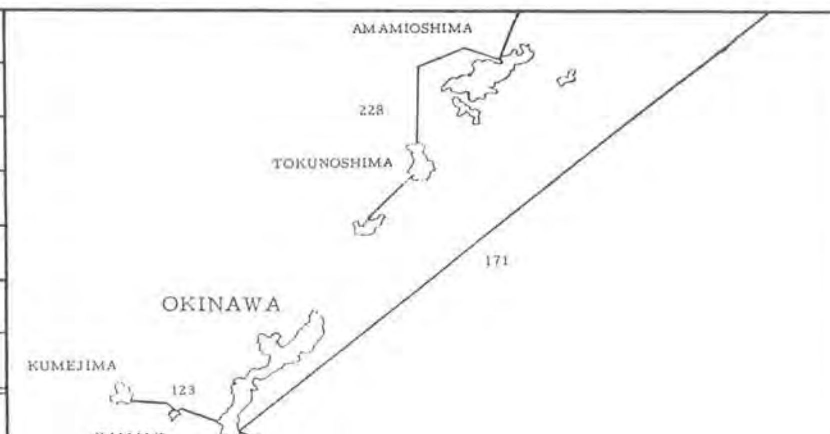
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 2700 — CHANNEL SPACING, INITIAL: 4 kHz

TERMINAL EQUIPMENT MANUFACTURER: NEC and Fujitsu — CONSTRUCTION CONTRACTOR: NTTPC

POWER FEED MODE: double end — NOMINAL VOLTAGE: 400/400 — SYSTEM CURRENT: 0.156 A

TASI TYPE - — CIRCUITS USED: -- — CIRCUITS DERIVED: - — TOTAL CIRCUITS: - — DATE APPLIED: -

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **229**

OFFICIAL NAME	U.K. - Spain 3		
OTHER NAMES	England - Spain No. 3	Rodiles - Land's End B	UK - SP 3
COUNTRY A	Spain	COUNTRY B	Great Britain
TERMINUS A	Villaviciosa (Oviedo)	TERMINUS B	Land's End, Cornwall
LANDING POINT A	Arenal de Rodiles	LANDING POINT B	Porthcurno
COORDINATES A	43°32'N x 05°23'W	COORDINATES B	50°03'N x 05°39'W

OWNER A	Companía Telefónica Nacional de España	CIRCUITS HELD	4140 h
OWNER B	British Telecom International	CIRCUITS HELD	4140 h
I R U HOLDERS	PTT Morocco	CANTV	
CIRCUITS HELD	36	16	
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1980	NATURE OF SERVICE	commercial	CABLE MILES	429	SINGLE OR TWIN	single	SYSTEM TYPE	NG 1-45M

CABLE DESCRIPTION	unarmored polyethylene coaxial (approx. 50% armored)	CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones and Cables Limited	CABLESHIP(S) USED	ALERT (4)

REPEATER DESCRIPTION	monocontainer inflexible bidirectional	NUMBER OF REPEATERS	155	REPEATER SPACING	2.8

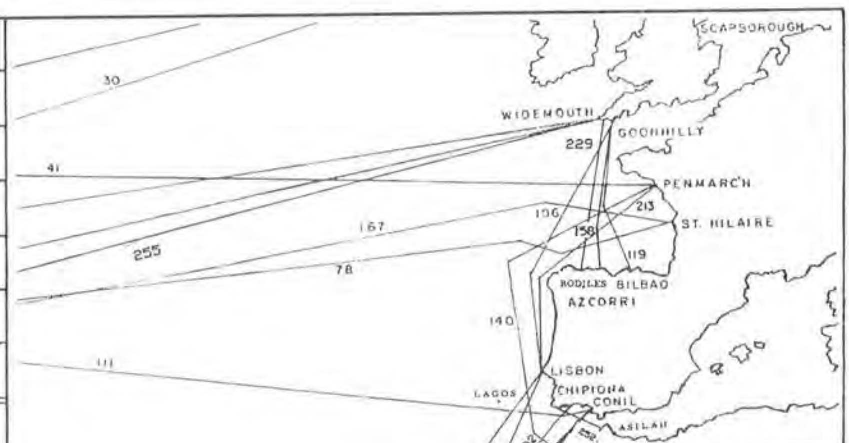
REPEATER MANUFACTURER	Standard Telephones and Cables Limited

NOMINAL TRANSMISSION BANDWIDTH	17000+17000 kHz	TRANSMISSION FREQUENCIES	1900-19004+27196-44300 kHz
NUMBER OF EQUALIZERS	5	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	4140	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.	CONSTRUCTION CONTRACTOR	STC

POWER FEED MODE	double end	NOMINAL VOLTAGE	1385/1385	SYSTEM CURRENT	0.500 A

TASI TYPE - CIRCUITS USED	- -	CIRCUITS DERIVED	--	TOTAL CIRCUITS	-	DATE APPLIED	-

COST (approximately)	$ MILLION
CABLE	11.3
SUBMERGED ELECTRONICS	19.0
TERMINAL AND POWER FEED	2.1
TERMINAL STATIONS	-
INSTALLATION	5.6
TOTAL	38.0
SYSTEM DESIGN LIFE	25 yrs.



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **230**

OFFICIAL NAME	Ivory Coast - Nigeria		
OTHER NAMES	Abidjan - Lagos	Union Cable	
COUNTRY A	Ivory Coast	COUNTRY B	Nigeria
TERMINUS A	Abidjan	TERMINUS B	Lagos
LANDING POINT A	Abidjan	LANDING POINT B	Lagos
COORDINATES A	$05^{\circ}21'$N x $04^{\circ}08'$W	COORDINATES B	$03^{\circ}15'$N x $06^{\circ}15'$E

OWNER A	Socité des Télécommunications Internationales de Côte d'Ivoire	CIRCUITS HELD	480 h
OWNER B	Nigerian External Telecommunications	CIRCUITS HELD	480 h

I R U HOLDERS	INTELFRA	Deutsche Bundespost	STICI	TELESENEGAL	Benin	CITA
CIRCUITS HELD	14	13	6	3	4	1
LESSEES						
CIRCUITS LEASED						

DATE IN SERVICE	1980	NATURE OF SERVICE	commercial	CABLE MILES	604	SINGLE OR TWIN	single	SYSTEM TYPE	S 5

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	VERCORS

REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	53	REPEATER SPACING	12 nm

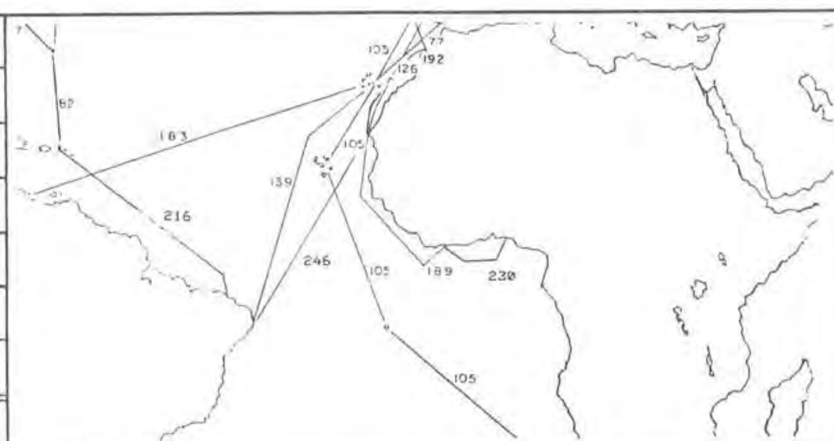
REPEATER MANUFACTURER	Compagnie Industrielle des Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM

POWER FEED MODE	double end	NOMINAL VOLTAGE	1325/1325	SYSTEM CURRENT	0.180 A

TASI TYPE -	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	MILLION FF
CABLE	46.0
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	0.8
TERMINAL STATIONS	
INSTALLATION	7.0
TOTAL	53.8
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **231**

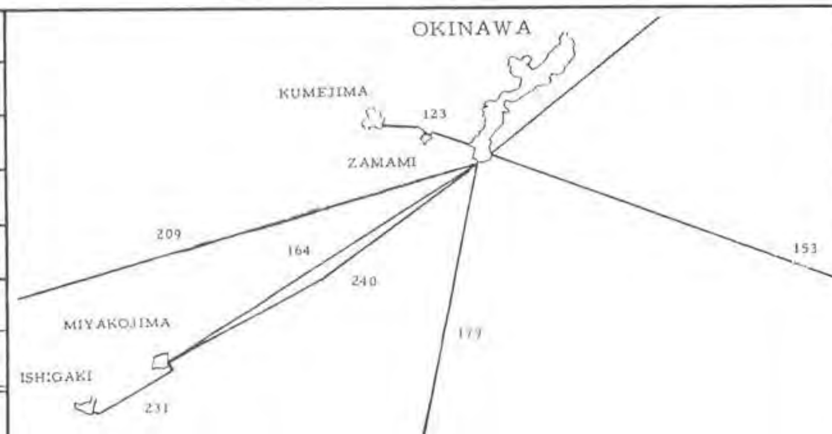
OFFICIAL NAME	Miyako - Yaeyama		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Ueno	TERMINUS B	Touri
LANDING POINT A	Miyako, Okinawa	LANDING POINT B	Ishigaki, Okinawa
COORDINATES A	$24^{\circ}47'$ N x $129^{\circ}13'$ E	COORDINATES B	$24^{\circ}23'$ N x $124^{\circ}11'$ E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	63	SINGLE OR TWIN	single	SYSTEM TYPE	CS - 10M

CABLE DESCRIPTION	unarmored polyethylene coaxial — CABLE SIZE 1.00" 25.4 mm
CABLE MANUFACTURER	Ocean Cable Company Ltd. — CABLESHIP USED: TSUGARU MARU
REPEATER DESCRIPTION	monocontainer flexible bidirectional — NUMBER OF REPEATERS 12 — REPEATER SPACING 5.36 nm
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.
NOMINAL TRANSMISSION BANDWIDTH	3600+3600 kHz — TRANSMISSION FREQUENCIES 312-4028+5872-9588 kHz
NUMBER OF EQUALIZERS	none — EQUALIZATION METHOD -
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	900 — CHANNEL SPACING, INITIAL 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	NEC and Fujitsu — CONSTRUCTION CONTRACTOR NTTPC
POWER FEED MODE	double end — NOMINAL VOLTAGE 300/300 — SYSTEM CURRENT 0.09 A
TASI TYPE -	CIRCUITS USED - — CIRCUITS DERIVED - — TOTAL CIRCUITS - — DATE APPLIED -

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **232**

OFFICIAL NAME	Japan - Korea		
OTHER NAMES	Hamada - Pusan		
COUNTRY A	Japan	COUNTRY B	Korea
TERMINUS A	Hamada	TERMINUS B	Pusan
LANDING POINT A	Hamada	LANDING POINT B	Pusan
COORDINATES A		COORDINATES B	

OWNER A	Kokusai Denshin Denwa Company Limited	CIRCUITS HELD	2700 h
OWNER B	Korean Telecommunications Authority	CIRCUITS HELD	2700 h
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	154	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36M DR
CABLE DESCRIPTION	unarmored polyethylene coaxial							CABLE SIZE	1.50" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Limited			CABLESHIP USED:	KDD MARU				
REPEATER DESCRIPTION	monocontainer flexible bidirectional					NUMBER OF REPEATERS	50	REPEATER SPACING	3.1 nm
REPEATER MANUFACTURER	Nippon Electric Company Ltd. and Fujitsu Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35468 kHz						
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	fixed						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700					CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu and NEC					CONSTRUCTION CONTRACTOR	KDD		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1500/1500			SYSTEM CURRENT	0.156 A		
TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **233**

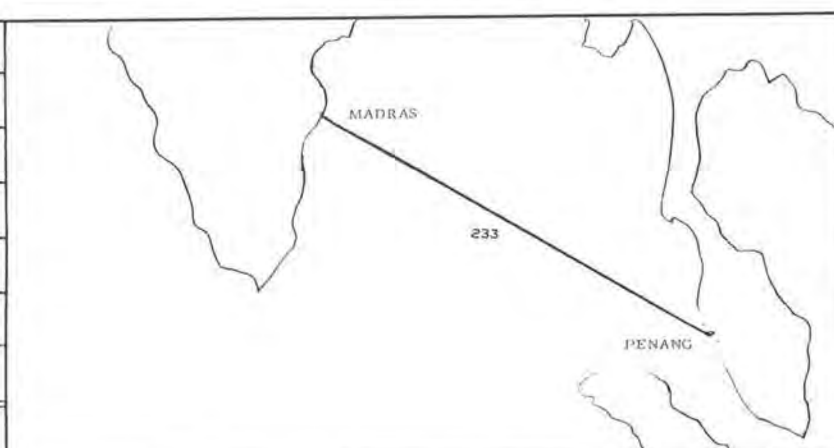
OFFICIAL NAME	Malaysia - India		
OTHER NAMES	Indian Ocean Commonwealth Cable, Phase I		IOCOM
COUNTRY A	Malaysia	COUNTRY B	India
TERMINUS A	Penang	TERMINUS B	Madras
LANDING POINT A	Kuala Muda	LANDING POINT B	Marina Beach
COORDINATES A	$05^{\circ}34'$ N x $100^{\circ}22'$ E	COORDINATES B	$13^{\circ}04'$ N x $80^{\circ}17'$ E

OWNERS	Jabatan Telekom Malaysia, Overseas Communications Service (India),				
	Cable and Wireless, Overseas Telecommunications Service,				
	(Sri Lanka), Overseas Telecommunications Commission (Australia),				
	The Telecommunications Authority of Singapore (Telecoms), and				
	Teleglobe Canada. IRU HOLDERS:	AT&T	WUI	RCA	ITT
	Circuits held:	120	4	4	4

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	1353	SINGLE OR TWIN	single	SYSTEM TYPE	NC

CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	0.99"
CABLE MANUFACTURER	Standard Telephones and Cables Limited
CABLESHIP(S) USED	CABLE VENTURE
REPEATER DESCRIPTION	monocontainer inflexible bidirectional
NUMBER OF REPEATERS	173
REPEATER SPACING	7.5 nm
REPEATER MANUFACTURER	Standard Telephones and Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	1980 + 1980 kHz
TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	11
EQUALIZATION METHOD	assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	2260/2260
SYSTEM CURRENT	0.150 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST (approximate)	$ MILLION
CABLE	22.3
SUBMERGED ELECTRONICS	17.9
TERMINAL AND POWER FEED	3.0
TERMINAL STATIONS	1.8
INSTALLATION	10.4
TOTAL	55.4
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **234**

OFFICIAL NAME	Greece - Syria		
OTHER NAMES	PALMYRA		
COUNTRY A	Greece	COUNTRY B	Syria
TERMINUS A	Heraklion, Crete	TERMINUS B	Tartous
LANDING POINT A	Amnissos	LANDING POINT B	Tartous
COORDINATES A	35°20'N x 25°12'E	COORDINATES B	34°51'N x 35°53'E

OWNER A	Hellenic Telecommunications Organization (OTE)	CIRCUITS HELD	480 h
OWNER B	Telecommunications Establishment of Syria	CIRCUITS HELD	480 h

I R U HOLDERS	France	Austria	Radio Aus	Libya	Switzerland	Italcable	BTI	CYTA	Jordan
CIRCUITS HELD	60	12	1	12	12	12	12	12	60
LESSEES									
CIRCUITS LEASED									

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	647	SINGLE OR TWIN	single	SYSTEM TYPE	S 5

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Les Câbles de Lyon	CABLESHIP USED:	VERCORS

REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	53	REPEATER SPACING	12 nm

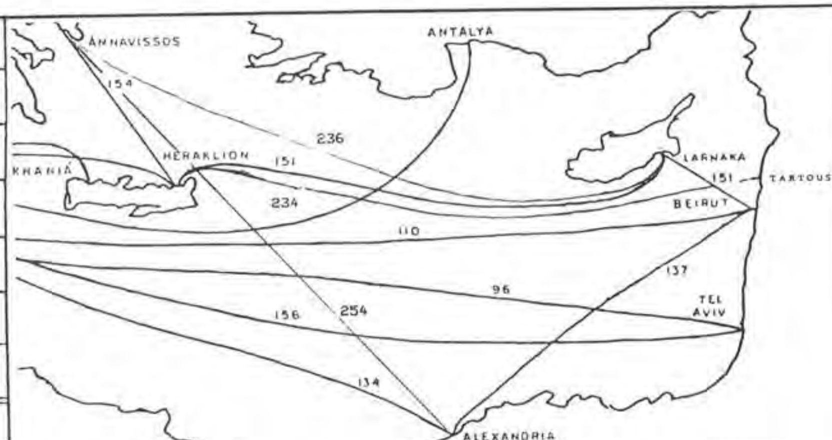
REPEATER MANUFACTURER Compagnie Industrielle des Télécommunications CIT ALCATEL

NOMINAL TRANSMISSION BANDWIDTH	1980+1980 kHz	TRANSMISSION FREQUENCIES	312-2292+2792-4772 kHz
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	adjusted on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	480	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM

POWER FEED MODE	double end	NOMINAL VOLTAGE	850/850	SYSTEM CURRENT	0.180 A

TASI TYPE - CIRCUITS USED	--	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	5.0
SUBMERGED ELECTRONICS	3.0
TERMINAL AND POWER FEED	-
TERMINAL STATIONS	0.7
INSTALLATION	1.3
TOTAL	10.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **235**

OFFICIAL NAME	Kagoshima - Yakushima		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Nagayoshi	TERMINUS B	Nagata
LANDING POINT A	Fukiagehama, Kagoshima	LANDING POINT B	Nagata, Yakushima
COORDINATES A	$31^{\circ}36'$ N x $130^{\circ}24'$ E	COORDINATES B	$30^{\circ}17'$ N x $130^{\circ}24'$ E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	All

DATE IN SERVICE 1981 | NATURE OF SERVICE commercial | CABLE MILES 110 | SINGLE OR TWIN single | SYSTEM TYPE CS-36M-D1

CABLE DESCRIPTION unarmored polyethylene coaxial | CABLE SIZE 1.00" 25.4 mm; 1.50" 38.1 mm

CABLE MANUFACTURER Ocean Cable Company Ltd. | CABLESHIP USED: KUROSHIO MARU

REPEATER DESCRIPTION monocontainer flexible bidirectional | NUMBER OF REPEATERS 48 | REPEATER SPACING 2.17 nm 3.12 nm

REPEATER MANUFACTURERS Fujitsu Limited and Nippon Electric Company Ltd.

NOMINAL TRANSMISSION BANDWIDTH 12672+12672 kHz | TRANSMISSION FREQUENCIES 4332-17004+22796-35468 kHz

NUMBER OF EQUALIZERS 2 | EQUALIZATION METHOD magnetic external stepping

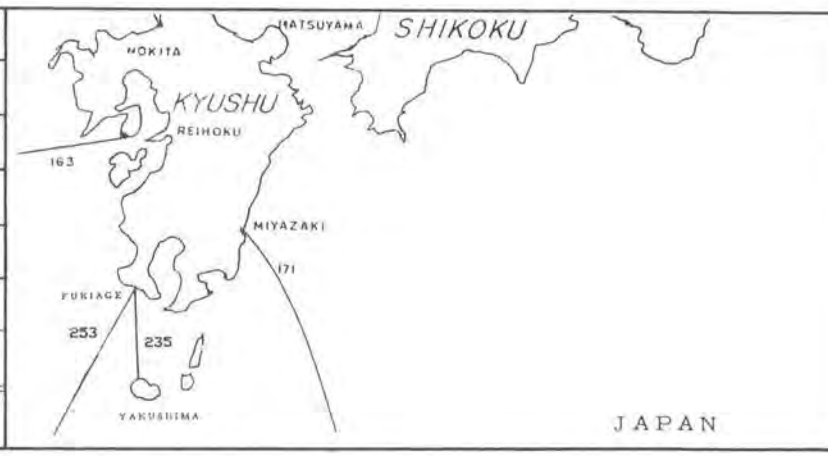
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 2700 | CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER NEC and Fujitsu | CONSTRUCTION CONTRACTOR NTTPC

POWER FEED MODE double end | NOMINAL VOLTAGE 600/600 | SYSTEM CURRENT 0.156 A

TASI TYPE - | CIRCUITS USED - | CIRCUITS DERIVED - | TOTAL CIRCUITS - | DATE APPLIED -

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **236**

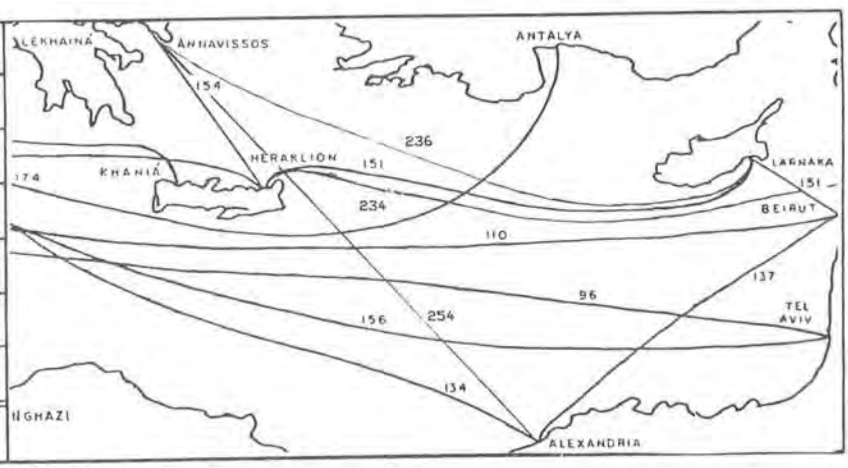
OFFICIAL NAME	Greece - Cyprus 2		
OTHER NAMES	APOLLO		
COUNTRY A	Greece	COUNTRY B	Cyprus
TERMINUS A	Lagonissi (Athens)	TERMINUS B	Larnaka
LANDING POINT A	Anavissos	LANDING POINT B	Larnaka
COORDINATES A	37°45'N x 23°55'E	COORDINATES B	34°59'N x 33°38'E

OWNER A	Hellenic Telecommunications Organization (OTE)				CIRCUITS HELD	1380 h
OWNER B	Cyprus Telecommunications Authority				CIRCUITS HELD	1380 h
I R U HOLDERS	Austria	Radio Aus	France	Switzerland	Syria	BTI
CIRCUITS HELD	12	1	6	12	12	60
LESSEES						
CIRCUITS LEASED						

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	639	SINGLE OR TWIN	single	SYSTEM TYPE	NE

CABLE DESCRIPTION	unarmored polyethylene coaxial; CABLE SIZE 1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones and Cables Limited; CABLESHIP(S) USED: CABLE VENTURE
REPEATER DESCRIPTION	monocontainer inflexible bidirectional; NUMBER OF REPEATERS: 99; REPEATER SPACING: 6.5 nm
REPEATER MANUFACTURER	Standard Telephones and Cables Limited
NOMINAL TRANSMISSION BANDWIDTH	5700+5700 kHz; TRANSMISSION FREQUENCIES 312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	6; EQUALIZATION METHOD: assembled on board
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380; CHANNEL SPACING, INITIAL 4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones & Cables Ltd.; CONSTRUCTION CONTRACTOR: STC
POWER FEED MODE	double end; NOMINAL VOLTAGE 1500/1500; SYSTEM CURRENT 0.470 A
TASI TYPE -	CIRCUITS USED - ; CIRCUITS DERIVED - ; TOTAL CIRCUITS - ; DATE APPLIED -

COST	$ MILLION
CABLE	17.5
SUBMERGED ELECTRONICS	15.5
TERMINAL AND POWER FEED	3.5
TERMINAL STATIONS	-
INSTALLATION	5.5
TOTAL	42.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **237**

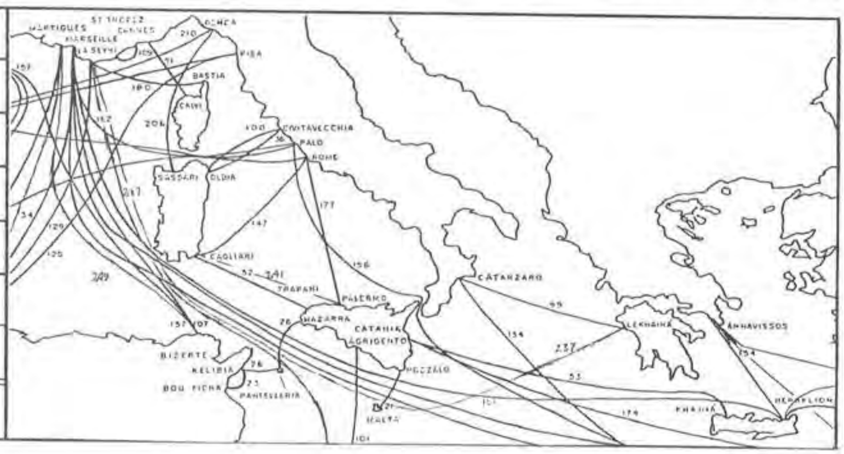
OFFICIAL NAME	France - Greece 2		
OTHER NAMES	ARTEMIS		
COUNTRY A	France	COUNTRY B	Greece
TERMINUS A	La Seyne Sur Mer	TERMINUS B	Lekhainá
LANDING POINT A	Les Sablettes	LANDING POINT B	Lekhainá
COORDINATES A	$43^{\circ}04'$ N x $05^{\circ}53'$ E	COORDINATES B	$37^{\circ}56'$ N x $21^{\circ}10'$ E

OWNER	HELLTELCA	CIRCUITS HELD	2580

IRU HOLDERS	OTE	FCR	Syria	Suisse	W. Germany	Belgium	Luxemburg	Austria	
CIRCUITS HELD	1080	900	60	132	300	60	24	60	
IRU HOLDERS	Algeria	Morocco	Tunisia	AT&T	Netherlands	BTI	CYTA	Portugal	France
CIRCUITS HELD	24	12	12	57	60	300	84	12	36

DATE IN SERVICE	1981
NATURE OF SERVICE	commercial
CABLE MILES	1048
SINGLE OR TWIN	single
SYSTEM TYPE	S 25/3
CABLE DESCRIPTION	unarmored polyethylene coaxial
CABLE SIZE	1.7" 43.2 mm
CABLE MANUFACTURER	Les Cables de Lyon
CABLESHIP(S) USED	VERCORS
REPEATER DESCRIPTION	monocontainer flexible bidiractional
NUMBER OF REPEATERS	210
REPEATER SPACING	5.1 nm
REPEATER MANUFACTURER	CIT - ALCATEL
NOMINAL TRANSMISSION BANDWIDTH	10652+10652 kHz
TRANSMISSION FREQUENCIES	812-11464+14576-25228 kHz
NUMBER OF EQUALIZERS	12
EQUALIZATION METHOD	automatic
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2580
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT - ALCATEL
CONSTRUCTION CONTRACTOR	SUBMARCOM
POWER FEED MODE	double end
NOMINAL VOLTAGE	4786/4786
SYSTEM CURRENT	0.545 A
TASI TYPE	-
CIRCUITS USED	-
CIRCUITS DERIVED	-
TOTAL CIRCUITS	-
DATE APPLIED	-

COST	$ MILLION
CABLE	26.702
SUBMERGED ELECTRONICS	22.939
TERMINAL AND POWER FEED	2.329
TERMINAL STATIONS	1.612
INSTALLATION	6.093
TOTAL	59.675
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **238**

OFFICIAL NAME	Taiwan - Guam	ACRONYM	TAIGU
OTHER NAMES	Republic of China - U.S.		
COUNTRY A	Republic of China	COUNTRY B	U.S.A. (Guam)
TERMINUS A	Toucheng	TERMINUS B	Agana
LANDING POINT A	Toucheng	LANDING POINT B	Tanguisson Point
COORDINATES A	24°51'N x 121°49'E	COORDINATES B	13°33'N x 144°49'E

OWNER	International Telecommunications Administration, R.O.C.	CIRCUITS HELD	630
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1981	NATURE OF SERVICE	commercial	CABLE MILES	1664	SINGLE OR TWIN	single	SYSTEM TYPE	SF

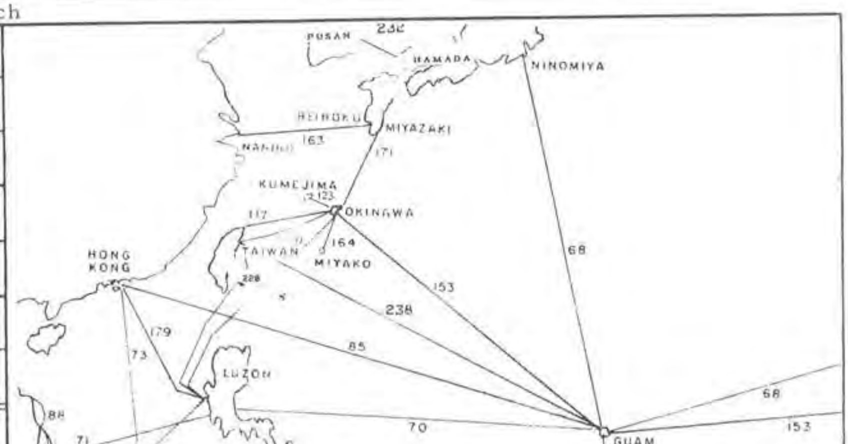
CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Simplex Wire & Cable Company	CABLESHIP(S) USED	LONG LINES

REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	171	REPEATER SPACING	10 nm
REPEATER MANUFACTURER	Western Electric Company				
NOMINAL TRANSMISSION BANDWIDTH	2160+2160 kHz	TRANSMISSION FREQUENCIES	554-2920+3575-5894 kHz		
NUMBER OF EQUALIZERS	5	EQUALIZATION METHOD	switched networks		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	630	CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company	CONSTRUCTION CONTRACTOR	ATT Long Lines		
POWER FEED MODE	double end	NOMINAL VOLTAGE	1500/1500	SYSTEM CURRENT	0.136 A

TASI TYPE E CIRCUITS USED	42*	CIRCUITS DERIVED	120	TOTAL CIRCUITS	240	DATE APPLIED	Feb. 1984

* Bearer 42 ch TASI-only 43 ch

COST	$ MILLION
CABLE	33.8
SUBMERGED ELECTRONICS	15.1
TERMINAL AND POWER FEED	4.2
TERMINAL STATIONS	-
INSTALLATION	11.3
TOTAL	64.4
SYSTEM DESIGN LIFE	25 years



SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

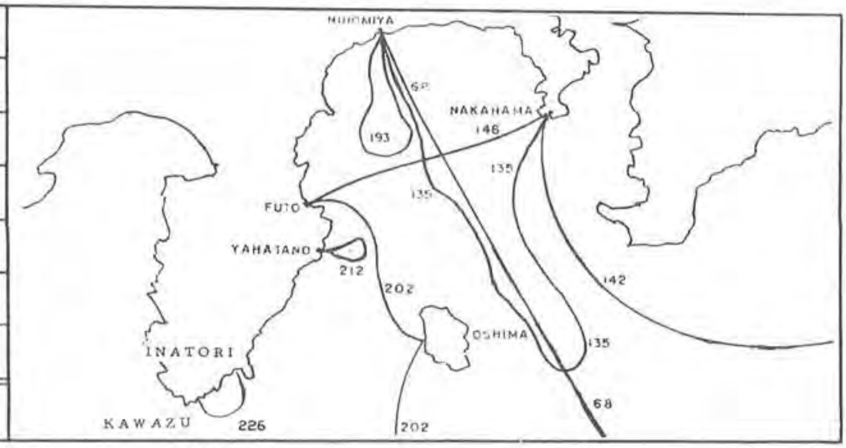
SYSTEM REFERENCE NUMBER **239**

OFFICIAL NAME	NTTPC First Sea Trial, Sagami Bay		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	
TERMINUS A		TERMINUS B	
LANDING POINT A		LANDING POINT B	
COORDINATES A		COORDINATES B	

OWNER A	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	
OWNER B		CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1981	NATURE OF SERVICE	experimental	CABLE MILES	0.9	SYSTEM TYPE DESIGNATION	
CABLE DESCRIPTION	six fibers						
						CABLE O. D.	
CABLE MANUFACTURER	Ocean Cable Company Ltd.			CABLESHIP(S) UTILIZED	TSUGARU MARU		
NUMBER OF REGENERATORS	1	REGENERATOR TYPE DESIGNATION				REGENERATOR SPACING	
REGENERATOR DESCRIPTION				REGENERATOR MANUFACTURER	NEC Corporation and Fujitsu Ltd.		
TERMINAL EQUIPMENT MANUFACTURER	NEC Corporation and Fujitsu Ltd.						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL				NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	1.3	TRANSMISSION BIT-RATE	400 Mb/s	CONSTRUCTION CONTRACTOR	NTTPC		
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT			

COST EXPERIMENTAL	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **240**

OFFICIAL NAME	Naha - Miyako Jima		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Gushichan	TERMINUS B	Ueno
LANDING POINT A	Naha, Okinawa	LANDING POINT B	Miyako Jima
COORDINATES A	$26^{\circ}07'$ N x $127^{\circ}45'$ E	COORDINATES B	$24^{\circ}43'$ N x $125^{\circ}18'$ E

OWNER	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	all

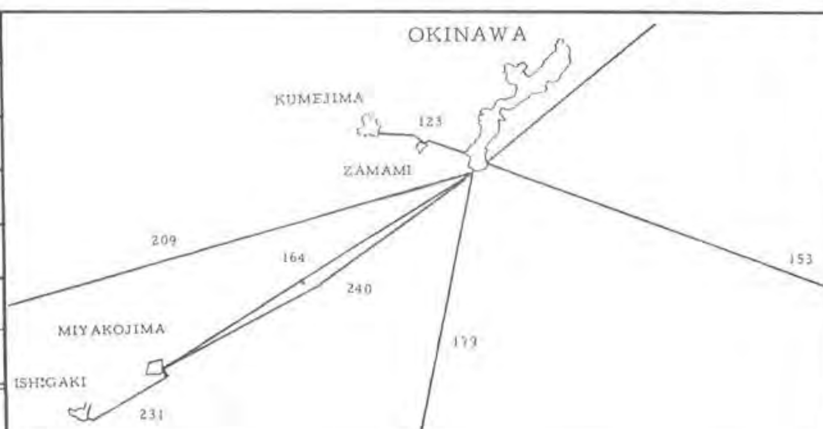
DATE IN SERVICE	1982	NATURE OF SERVICE	commercial	CABLE MILES	179	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36MD1

CABLE DESCRIPTION	Unarmored polyethylene coaxial	CABLE SIZE	1.00" 25.4 mm 1.50" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Ltd.	CABLESHIP(S) USED	KUROSHIO MARU

REPEATER DESCRIPTION	monocontainer bidirectional flexible	NUMBER OF REPEATERS	54	REPEATER SPACING	2.43 nm 3.43 nm
REPEATER MANUFACTURER	Fujitsu Limited and NEC Corporation				
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35469 kHz		
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	magnetic external stepping		
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	CHANNEL SPACING, INITIAL	4 kHz		
TERMINAL EQUIPMENT MANUFACTURERS	Fujitsu and NEC	CONSTRUCTION CONTRACTOR	NTTPC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	700/700	SYSTEM CURRENT	0.156 A

TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **241**

OFFICIAL NAME	Sardinia - Sicily 2		
OTHER NAMES	Palermo - Cagliari		
COUNTRY A	Italy	COUNTRY B	Italy
TERMINUS A	Palermo, Sicily	TERMINUS B	Cagliari
LANDING POINT A	Palermo	LANDING POINT B	Cagliari, Sardinia
COORDINATES A	$38^{0}08'$ N x $13^{0}20'$ E	COORDINATES B	$39^{0}13'$ N x $09^{0}06'$ E

OWNER	Aziendo di Stato per i Servizi Telefonici

DATE IN SERVICE	1982	NATURE OF SERVICE	commercial	CABLE MILES	247	SINGLE OR TWIN	single	SYSTEM TYPE	NG 1

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.47" 37.3mm

CABLE MANUFACTURER Standard Telephones & Cables PLC — CABLESHIP(S) USED CABLE VENTURE

REPEATER DESCRIPTION monocontainer inflexible bidirectional — NUMBER OF REPEATERS 83 — REPEATER SPACING 3 nm

REPEATER MANUFACTURER Standard Telephones & Cables PLC

NOMINAL TRANSMISSION BANDWIDTH 17000+17000 kHz — TRANSMISSION FREQUENCIES 1916-18988+27212-44284 kHz

NUMBER OF EQUALIZERS 3 — EQUALIZATION METHOD assembled on board

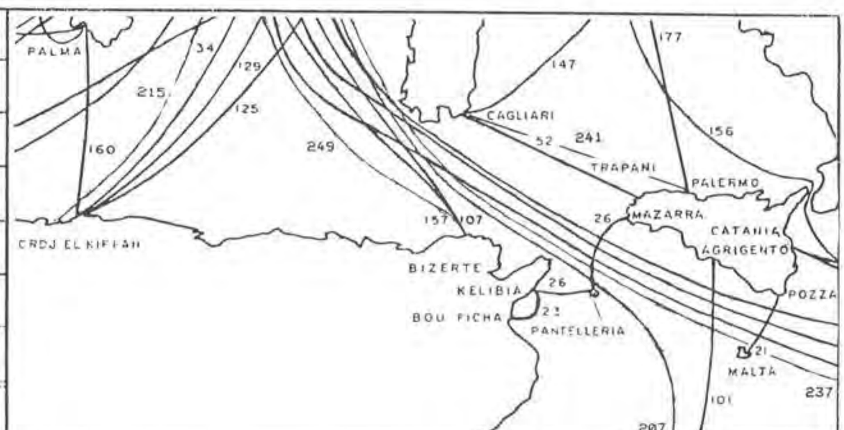
NOMINAL VOICE CIRCUIT CAPACITY 3900 — CHANNEL SPACING 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Standard Telephones & Cables PLC — CONSTRUCTION CONTRACTOR STC

POWER FEED MODE double end — NOMINAL VOLTAGE 2000/2000 — SYSTEM CURRENT 0.500 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	5.4
SUBMERGED ELECTRONICS	10.2
TERMINAL AND POWER FEED	2.4
TERMINAL STATIONS	-
INSTALLATION	2.0
TOTAL	20.0
SYSTEM DESIGN LIFE	25 years



SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

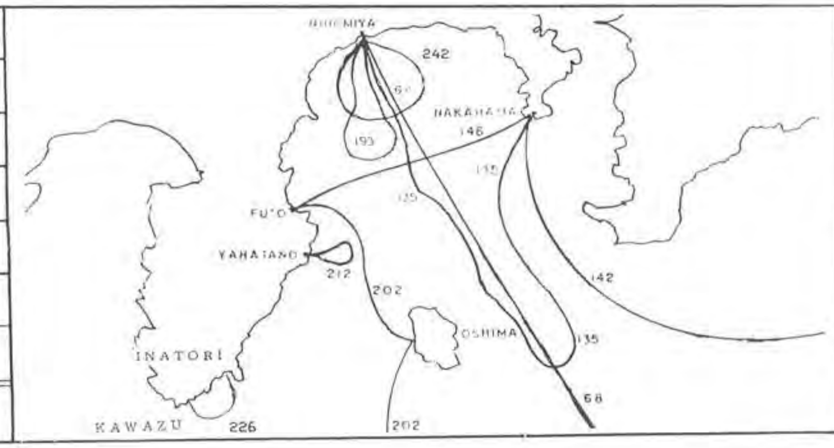
SYSTEM REFERENCE NUMBER **242**

OFFICIAL NAME	KDD First Sea Trial		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Ninomiya	TERMINUS B	Ninomiya
LANDING POINT A	Ninomiya	LANDING POINT B	Ninomiya
COORDINATES A	$35^{\circ}17'$ N x $139^{\circ}16'$ E	COORDINATES B	$35^{\circ}17'$ N x $139^{\circ}16'$ E

OWNER	Kokusai Denshin Denwa Company Ltd. KDD

DATE IN SERVICE	1982	NATURE OF SERVICE	experimental	CABLE MILES	30	SYSTEM TYPE DESIGNATION	300 Mb/s
CABLE DESCRIPTION	6 single-mode fibers enclosed in a metal tube						
						CABLE O. D.	
CABLE MANUFACTURER	Ocean Cable Company Ltd.			CABLESHIP(S) UTILIZED	KDD MARU		
NUMBER OF REGENERATORS	2	REGENERATOR TYPE DESIGNATION				REGENERATOR SPACING	18 nm
REGENERATOR DESCRIPTION	LD duplicate			REGENERATOR MANUFACTURER	Fujitsu Ltd. and NEC Corporation		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd. and NEC Corporation						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	4000			NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	$1.3 \mu m$	TRANSMISSION BIT-RATE	300 Mb/s	CONSTRUCTION CONTRACTOR	KDD		
POWER FEED MODE	double end	NOMINAL VOLTAGE		SYSTEM CURRENT	1.0 A		

COST	EXPERIMENTAL $ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

REMOVED 1984

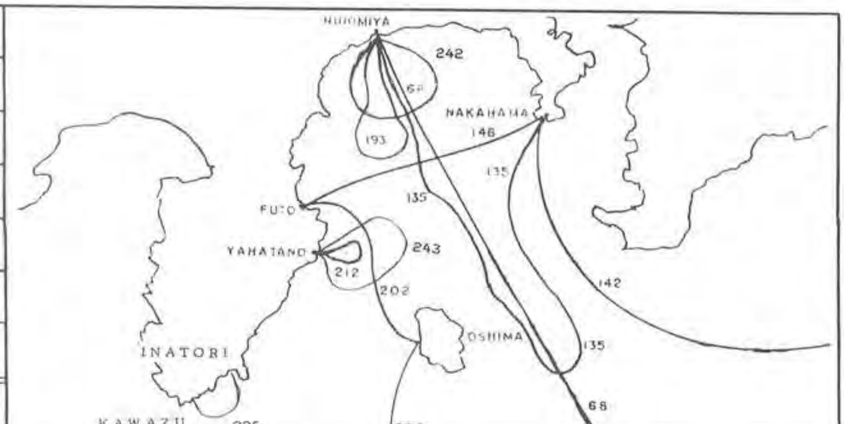
SYSTEM REFERENCE NUMBER **243**

OFFICIAL NAME	NTTPC Field Research - Fiber Optic		
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Yahatano	TERMINUS B	Yahatano
LANDING POINT A	Yahatano	LANDING POINT B	Yahatano
COORDINATES A	$34^{\circ}53'$ N x $139^{\circ}07'$ E	COORDINATES B	same

OWNER	Nippon Telegraph and Telephone Public Corporation NTTPC

DATE IN SERVICE	1982	NATURE OF SERVICE	experimental	CABLE MILES	27	SYSTEM TYPE DESIGNATION	FS-400M
CABLE DESCRIPTION	6 single-mode fibers enclosed in a metal tube						
						CABLE O. D.	
CABLE MANUFACTURER	Ocean Cable Company Ltd.			CABLESHIP(S) UTILIZED	KUROSHIO MARU		
NUMBER OF REGENERATORS	2	REGENERATOR TYPE DESIGNATION				REGENERATOR SPACING	18 nm
REGENERATOR DESCRIPTION	LD single			REGENERATOR MANUFACTURER	Fujitsu Ltd. and NEC Corp.		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd. and NEC Corporation						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	5760 x 2			NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	1.3 um	TRANSMISSION BIT-RATE	400 Mb/s	CONSTRUCTION CONTRACTOR	NTTPC		
POWER FEED MODE	double end	NOMINAL VOLTAGE	240/240	SYSTEM CURRENT	1.0 A		

COST EXPERIMENTAL	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **244**

OFFICIAL NAME	AT&T First Sea Trial
OTHER NAMES	
COUNTRY	U.S.A.
TERMINUS	Ship loop

OWNER	AT&T Communications, Inc.

DATE IN SERVICE	1982	NATURE OF SERVICE	experimental	CABLE MILES	12	SYSTEM TYPE DESIGNATION	SL
CABLE DESCRIPTION	Twelve single-mode fibers						
						CABLE O. D.	
CABLE MANUFACTURER	Simplex Wire and Cable Company			CABLESHIP(S) UTILIZED	LONG LINES		
NUMBER OF REGENERATORS	2	REGENERATOR TYPE DESIGNATION	SL			REGENERATOR SPACING	
REGENERATOR DESCRIPTION	monocontainer flexible			REGENERATOR MANUFACTURER	Western Electric Company		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL				NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	1.3	TRANSMISSION BIT-RATE	274 & 420 Mb/s	CONSTRUCTION CONTRACTOR	AT&T		
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT			

COST EXPERIMENTAL	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	

SEACABLE SYSTEM DATA PROFILE

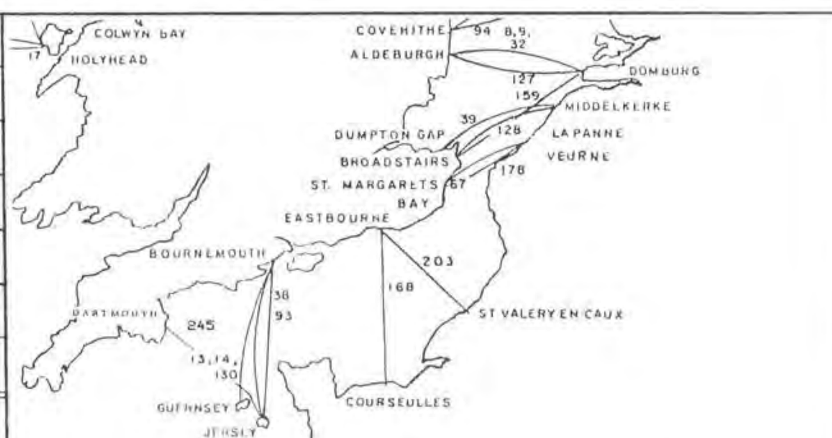
SYSTEM REFERENCE NUMBER **245**

OFFICIAL NAME	U.K. - Channel Isles 6		
OTHER NAMES			
COUNTRY A	England	COUNTRY B	Jersey, Channel Isls.
TERMINUS A	Dartmouth	TERMINUS B	St. Helier
LANDING POINT A	Stoke Fleming	LANDING POINT B	St. Helier
COORDINATES A	50°19' N x 03°36' W	COORDINATES B	49°08' x 02°05' W

OWNER A	British Telecom	CIRCUITS HELD	1380 h
OWNER B	Telecommunications Boards of Jersey and Guernsey	CIRCUITS HELD	1380 h

DATE IN SERVICE	1982
NATURE OF SERVICE	commercial
CABLE MILES	109
SINGLE OR TWIN	single
SYSTEM TYPE	NE 14M
CABLE DESCRIPTION	armored polyethylend coaxial
CABLE SIZE	1.47" 37.3 mm
CABLE MANUFACTURER	Standard Telephones & Cables PLC
CABLESHIP(S) USED	ALERT (4)
REPEATER DESCRIPTION	Monocontainer bidirectional with auto. gain control
NUMBER OF REPEATERS	18
REPEATER SPACING	6 nm
REPEATER MANUFACTURER	Standard Telephones and Cables PLC
NOMINAL TRANSMISSION BANDWIDTH	5704+5704 kHz
TRANSMISSION FREQUENCIES	312-6016+7996-13700 kHz
NUMBER OF EQUALIZERS	none
EQUALIZATION METHOD	-
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1380
CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	Standard Telephones and Cables PLC
CONSTRUCTION CONTRACTOR	STC
POWER FEED MODE	double end
NOMINAL VOLTAGE	500/500
SYSTEM CURRENT	0.470 A
TASI TYPE	
CIRCUITS USED	
CIRCUITS DERIVED	
TOTAL CIRCUITS	
DATE APPLIED	

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	16.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

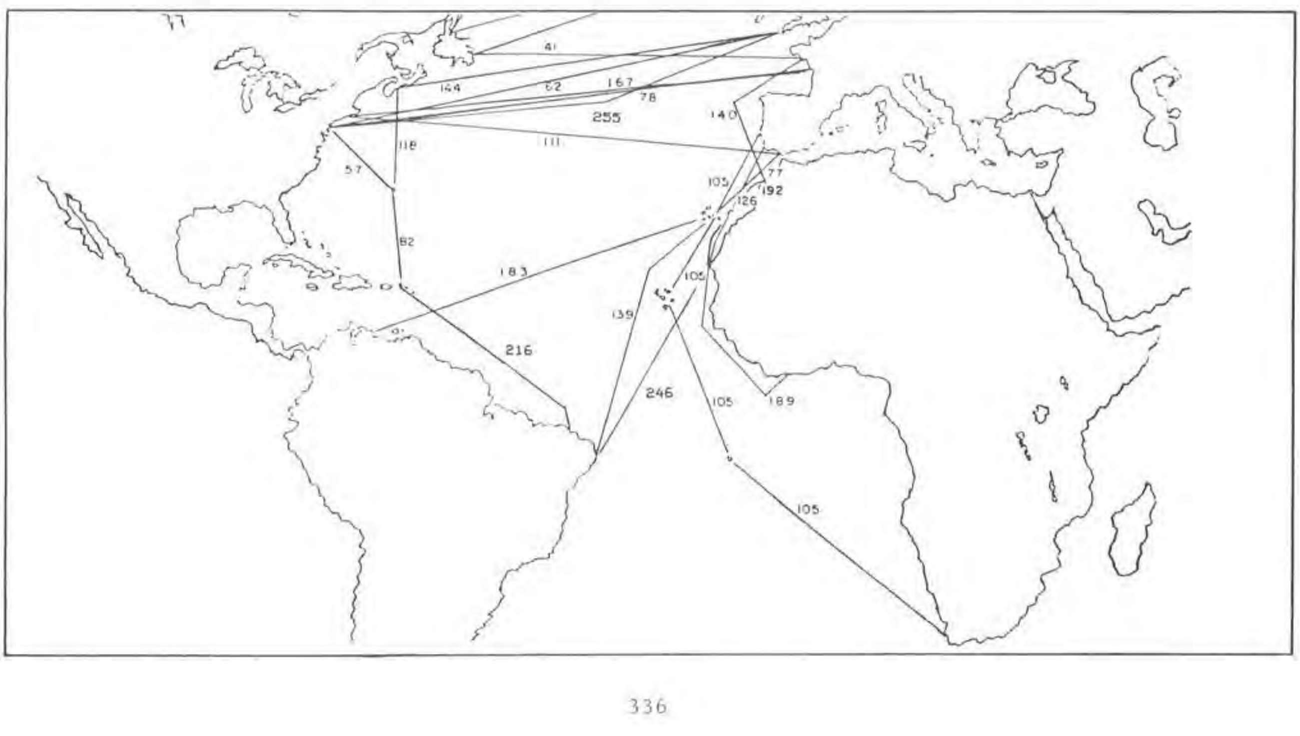
SYSTEM REFERENCE NUMBER **246**

OFFICIAL NAME	Portugal - Senegal - Brazil
OTHER NAMES	ATLANTIS

COUNTRY A	Portugal	COUNTRY B	Senegal
TERMINUS A	Burgau, Lagos	TERMINUS B	Dakar
LANDING POINT A	Burgau	LANDING POINT B	Anse Bernard
COORDINATES A	$37^{o}04'$ N x $08^{o}46'$ W	COORDINATES B	$14^{o}42'$ N x $17^{o}28'$ W

COUNTRY C	Brazil
TERMINUS C	Recife, Pernambuco
LANDING POINT C	Boa Viagem Beach
COORDINATES C	$08^{o}08'$ S x $34^{o}53'$ W

CABLE MILES	AB 1577	B C 1847					
DATE IN SERVICE	1982	NATURE OF SERVICE	commercial	SINGLE OR TWIN	single	SYSTEM TYPE	AB: S 25 BC: NE(14M)
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	AB: 1.70" 43.2 mm BC: 1.47" 37.3 mm
CABLE MANUFACTURERS	AB: Les Cables de Lyon	BC: Standard Telephones & Cables PLC					



OWNERS Percentages	A - B	B - C		A - B	B - C		A - B	B - C
ENTEL (Argentina)	4.76	9.94	ITALCABL	5.81	8.84	INTELCI	12.77	0.36
EMBRATEL	19.00	37.51	Senegal	10.9	0.43	CPRM	3.16	5.10
France	23.31	3.33	BTI	4.65	5.28	Austria	0.17	0.28
FCR	7.54	16.69	Suisse	2.38	2.75	Guinea	0.23	-
DBP	4.4	7.75	KDD	0.96	1.81			

REPEATER DESCRIPTION	AB: monocontainer flexible bidirectional BC: monocontainer inflexible bidirectional	REPEATER SPACING AB:5.62 BC:7.5
NUMBER OF REPEATERS	AB 294 BC 258	
REPEATER MANUFACTURER	AB: CIT - ALCATEL	BC: Standard Telephones & Cables PLC
NUMBER OF EQUALIZERS	AB 17 BC 16	CABLESHIP(S) USED VERCORS CABLE VENTURE
EQUALIZATION METHOD	AB: remote controlled	BC: adjusted on board
TERMINAL EQUIPMENT MANUFACTURER	AB: CIT	BC: STC
POWER FEED MODE	AB double end	BC double end
NOMINAL VOLTAGE	3300/3300 4250/4250	SYSTEM CURRENT AB:0.545A BC:0.470A
NOMINAL TRANSMISSION BANDWIDTH	AB: 10652+10652 kHz BC: 5700 + 5700 kHz	TRANSMISSION FREQUENCIES 812-11464+14576-25228kHz 312-6016 +7996 -13700 kHz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AB: 2340 BC: 1380	CHANNEL SPACING, INITIAL 4kHz 4kHz
TASI TYPE -	CIRCUITS USED - CIRCUITS DERIVED -	TOTAL CIRCUITS - DATE APPLIED -
REMARKS	A Stations: AB: Dakar BC: Dakar	CABLESHIPS USED: AB: VERCORS BC: CABLE VENTURE

CONSTRUCTION CONTRACTORS	AB: SUBMARCOM	BC: Standard Telephones and Cables PLC

COST	$ MILLION
CABLE	60.092
SUBMERGED ELECTRONICS	53.867
TERMINAL AND POWER FEED	4.615
TERMINAL STATIONS	2.247
INSTALLATION	16.522
TOTAL	137.343
SYSTEM DESIGN LIFE	25 years

SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

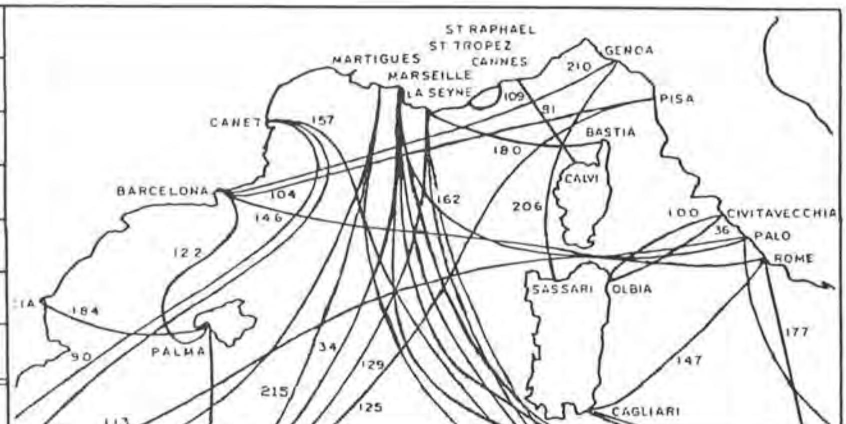
SYSTEM REFERENCE NUMBER **247**

OFFICIAL NAME	Juan-les-Pins - Cagnes-sur-Mer		
OTHER NAMES			
COUNTRY A	France	COUNTRY B	France
TERMINUS A	Juan-les-Pins	TERMINUS B	Cagnes-sur-Mer
LANDING POINT A	Juan-les-Pins	LANDING POINT B	Cagnes-sur-Mer
COORDINATES A		COORDINATES B	

OWNER	Centre National d'Etudes des Télécommunications

DATE IN SERVICE	1982	NATURE OF SERVICE	experimental	CABLE MILES	11	SYSTEM TYPE DESIGNATION	
CABLE DESCRIPTION	Two single-mode and 4 multi-mode fibers						
						CABLE O. D.	
CABLE MANUFACTURER	Les Cables de Lyon					CABLESHIP(S) UTILIZED	VERCORS
NUMBER OF REGENERATORS	none	REGENERATOR TYPE DESIGNATION	-			REGENERATOR SPACING	-
REGENERATOR DESCRIPTION	-			REGENERATOR MANUFACTURER	-		
TERMINAL EQUIPMENT MANUFACTURER	CIT-ALCATEL						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL						NOMINAL CHANNEL SPACING, INITIAL	
TRANSMISSION WAVELENGTH	1.3	TRANSMISSION BIT-RATE	340 Mb/s	CONSTRUCTION CONTRACTOR	SUBMARCOM		
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT			

COST	EXPERIMENTAL $ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	



SEACABLE SYSTEM DATA PROFILE

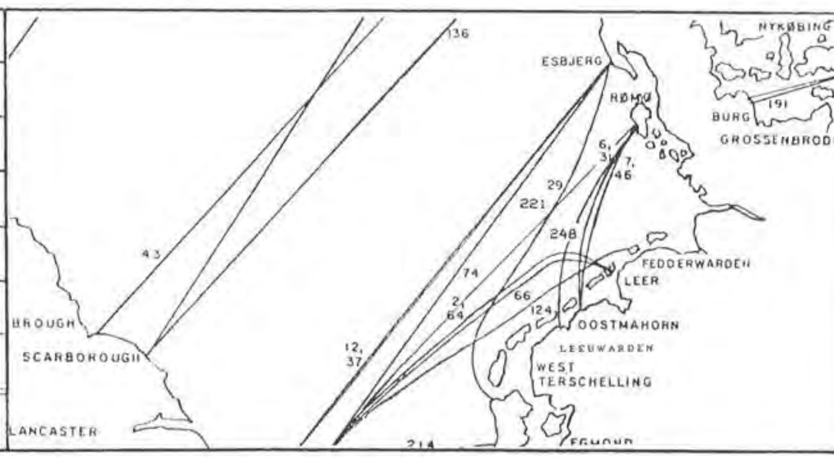
SYSTEM REFERENCE NUMBER **248**

OFFICIAL NAME	Netherlands - Denmark 4		
OTHER NAMES	Leeurwarden - Rømø		
COUNTRY A	Netherlands	COUNTRY B	Denmark
TERMINUS A	Leeurwarden	TERMINUS B	Rømø
LANDING POINT A	Anjum	LANDING POINT B	Rømø
COORDINATES A	53°24' N x 06°07' E	COORDINATES B	55°04' N x 08°29' E

OWNERS	Administrations of Denmark, Norway, Sweden, and Finland;
	Netherlands PTT and British Telecom International
	IRUs are held by CTNE with the Nordic Group
DISTRIBUTION:	Netherlands 0.333 and Britain 0.166; Denmark 0.18, Sweden 0.17, Norway 0.13,
	Finland 0.02

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	175	SINGLE OR TWIN	single	SYSTEM TYPE	CS-36M
CABLE DESCRIPTION	armored polyethylene coaxial					CABLE SIZE	1.50" 38.1 mm		
CABLE MANUFACTURER	Ocean Cable Company Ltd.					CABLESHIP(S) USED	VERCORS DIRECTEUR GENERAL BAST		
REPEATER DESCRIPTION	monocontainer flexible bidirectional auto.gain contr.					NUMBER OF REPEATERS	59	REPEATER SPACING	3.25 nm
REPEATER MANUFACTURER	Fujitsu Ltd.								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz			TRANSMISSION FREQUENCIES	4332-17004+22798-35468 kHz				
NUMBER OF EQUALIZERS	2	EQUALIZATION METHOD	magnetic external stepping						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI	2700					CHANNEL SPACING	4 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd.					CONSTRUCTION CONTRACTOR	Fujitsu		
POWER FEED MODE	double end	NOMINAL VOLTAGE	650/650			SYSTEM CURRENT	0.156 A		
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	5.1
SUBMERGED ELECTRONICS	5.5
TERMINAL AND POWER FEED	0.7
TERMINAL STATIONS	-
INSTALLATION	3.1
TOTAL	14.5
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **249**

OFFICIAL NAME	France - Tunisia 3		
OTHER NAMES	DIDON		
COUNTRY A	France	COUNTRY B	Tunisia
TERMINUS A	Martigues	TERMINUS B	Bizerte
LANDING POINT A	Martigues	LANDING POINT B	Bizerte
COORDINATES A	43°16' N x 05°03' E	COORDINATES B	37°17' N x 09°52' E

OWNER A	Direction Generale des Télécommunications	CIRCUITS HELD	
OWNER B	Administration of PTT	CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	484	SINGLE OR TWIN	single	SYSTEM TYPE	S25/3

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.7" 43.18 mm
CABLE MANUFACTURER	Les Cables de Lyon	CABLESHIP(S) USED	VERCORS

REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	97	REPEATER SPACING	5.6 nm

REPEATER MANUFACTURER CIT - ALCATEL

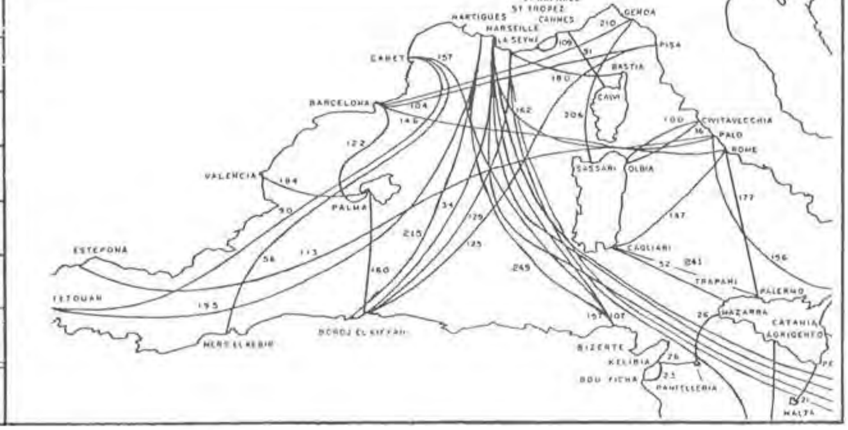
NOMINAL TRANSMISSION BANDWIDTH 10652+10652 kHz TRANSMISSION FREQUENCIES 812-1164+14576-25228 kHz

NUMBER OF EQUALIZERS	5	EQUALIZATION METHOD	remote controlled
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI	2580	CHANNEL SPACING	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT - ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM

POWER FEED MODE	double end	NOMINAL VOLTAGE	2350/2350	SYSTEM CURRENT	0.545 A

TASI TYPE	CIRCUITS USED	CIRCUITS DERIVED	TOTAL CIRCUITS	DATE APPLIED

COST	$ MILLION
CABLE	11.414
SUBMERGED ELECTRONICS	9.956
TERMINAL AND POWER FEED	1.536
TERMINAL STATIONS	-
INSTALLATION	2.603
TOTAL	25.509
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **250**

OFFICIAL NAME	Florida - St. Thomas 3	ACRONYM	ST. T 3
OTHER NAMES			
COUNTRY A	U. S. A.	COUNTRY B	U. S. A. (Virgin Islands)
TERMINUS A	Vero Beach	TERMINUS B	Magens Bay
LANDING POINT A	Vero Beach	LANDING POINT B	Magens Bay
COORDINATES A	27°38' N x 80°21' W	COORDINATES B	18°22' N x 64°56' W

OWNERS	American Telephone & Telegraph Company and
	CANTV, ITTCVI, ITTWC, RCAGC, TRT, WUI

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	1120	SINGLE OR TWIN	single	SYSTEM TYPE	SG

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.7" 43.2 mm

CABLE MANUFACTURER Simplex Wire and Cable Company — CABLESHIP(S) USED LONG LINES

REPEATER DESCRIPTION monocontainer bidirectional flexible — NUMBER OF REPEATERS 237 — REPEATER SPACING 5.1 nm

REPEATER MANUFACTURER Western Electric Company

NOMINAL TRANSMISSION BANDWIDTH 12000+12000 kHz — TRANSMISSION FREQUENCIES 1000-13500+16700-29300 kHz

NUMBER OF EQUALIZERS 10 — EQUALIZATION METHOD remote controlled

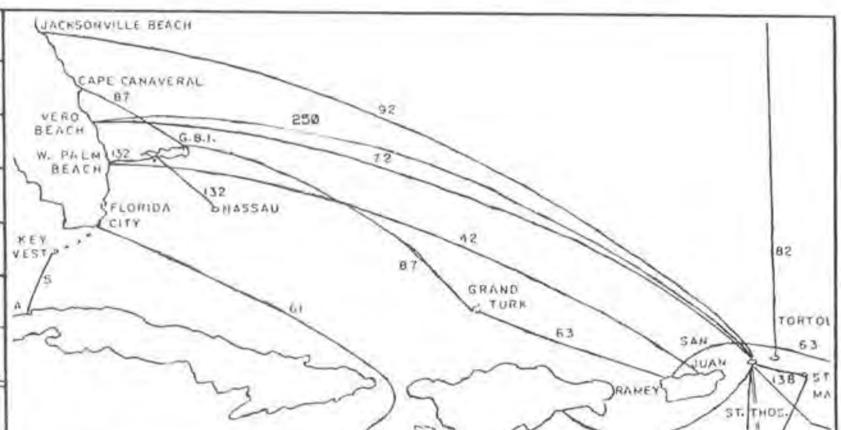
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 3000 — CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company — CONSTRUCTION CONTRACTOR AT&T

POWER FEED MODE double end — NOMINAL VOLTAGE 3700/3700 — SYSTEM CURRENT 0.657 A

TASI TYPE — CIRCUITS USED — CIRCUITS DERIVED — TOTAL CIRCUITS — DATE APPLIED

COST	$ MILLION
CABLE	41.5
SUBMERGED ELECTRONICS	23.0
TERMINAL AND POWER FEED	11.4
TERMINAL STATIONS	1.1
INSTALLATION (distributed)	
TOTAL	77.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

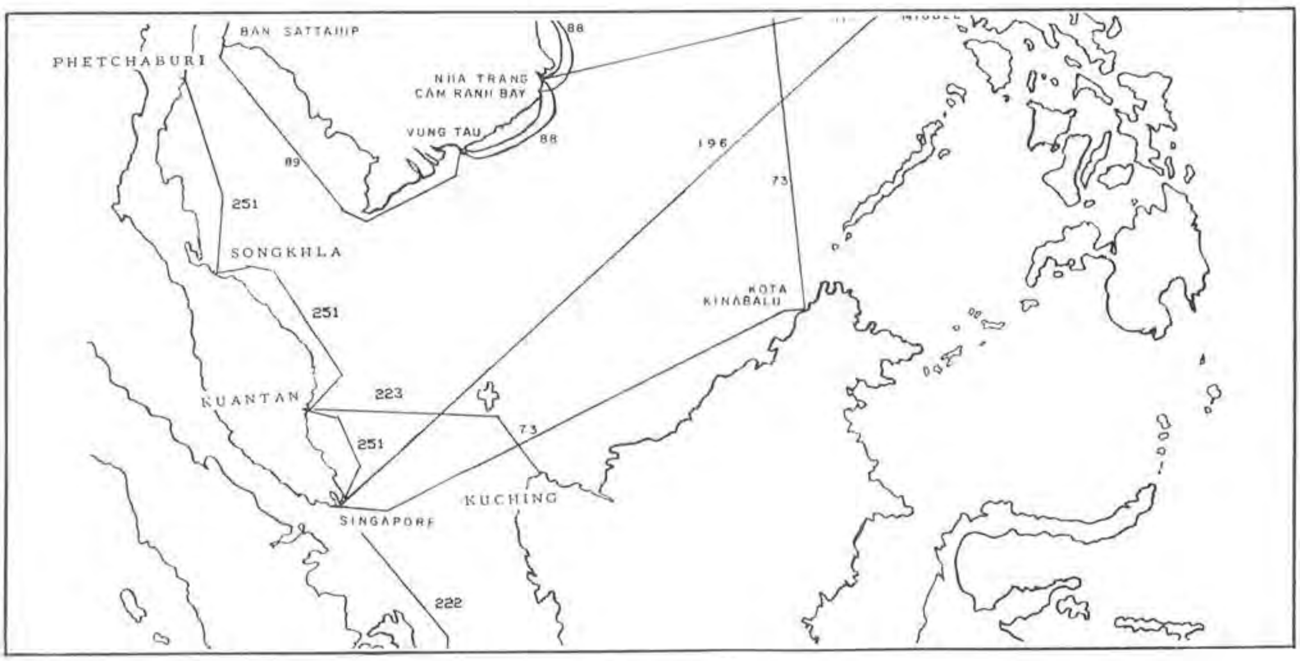
SYSTEM REFERENCE NUMBER **251**

OFFICIAL NAME	ASEAN Malaysia - Singapore - Thailand	ACRONYM	
OTHER NAMES	ASEAN M - S - T		

COUNTRY A	Republic of Singapore	COUNTRY B	Malaysia
TERMINUS A	Singapore	TERMINUS B	Kuantan
LANDING POINT A	Katong	LANDING POINT B	Cherating
COORDINATES A	$01^{\circ}18'$ N x $103^{\circ}54'$ E	COORDINATES B	$04^{\circ}06'$ N x $103^{\circ}23'$ E

COUNTRY C	Thailand	COUNTRY D	Thailand
TERMINUS C	Songkhla	TERMINUS D	Phetchaburi
LANDING POINT C	Ban Kaoseng	LANDING POINT D	Ban Hadchaosamran
COORDINATES C	$07^{\circ}11'$ N x $100^{\circ}37'$ E	COORDINATES D	$13^{\circ}00'$ N x $100^{\circ}04'$ E

CABLE MILES	AB 224	B C 330	C D 369		
DATE IN SERVICE	1983	NATURE OF SERVICE: commercial	SINGLE OR TWIN: single	SYSTEM TYPE	AC:CS 5M CD:CS 12M
CABLE DESCRIPTION	armored and unarmored polyethylene coaxial			CABLE SIZE	AC: 1.0" 25.4 mm CD: 1.5" 38.1 mm
CABLE MANUFACTURER	Ocean Cable Company Ltd.	CABLESHIP(S) USED	KUROSHIO MARU KDD MARU		



OWNERS	CAT (Thailand), ETPI (Philippines), INDOSAT (Indonesia), JTM (Malaysia),
	TELECOMS (Singapore), OTC (Australia), C&W (Hong Kong), KDD (Japan)

REPEATER DESCRIPTION	monocontainer flexible bidirectional; temperature-controlled AGC — REPEATER SPACING AC: 8.1 nm, CD: 6.8 nm
NUMBER OF REPEATERS	AB 28 · BC 41 · CD 55
REPEATER MANUFACTURERS	NEC Corporation and Fujitsu, Ltd.
NUMBER OF EQUALIZERS	AB 1 · BC 1 · CD 2
EQUALIZATION METHOD	fixed
TERMINAL EQUIPMENT MANUFACTURERS	NEC Corporation and Fujitsu Ltd.
POWER FEED MODE	AB double end · BC double end · CD double end
NOMINAL VOLTAGE	260/260 · 370/370 · 490/490 — SYSTEM CURRENT 0.1 A
NOMINAL TRANSMISSION BANDWIDTH	AC: 1980+1980 kHz; CD: 4952+4952 kHz — TRANSMISSION FREQUENCIES 312-2292+3068-5048 kHz; 564-5516+7436-12388 Khz
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	AC: 480; CD: 1200 — CHANNEL SPACING, INITIAL 4 kHz
TASI TYPE	- · CIRCUITS USED - · CIRCUITS DERIVED - · TOTAL CIRCUITS - · DATE APPLIED -
REMARKS	A-stations: Songkhla and Katong

CONSTRUCTION CONTRACTOR	Fujitsu, Ltd.

COST	$ MILLION
CABLE	28.5
SUBMERGED ELECTRONICS	15.1
TERMINAL AND POWER FEED	8.3
TERMINAL STATIONS	-
INSTALLATION	16.8
TOTAL	68.7
SYSTEM DESIGN LIFE	25 years

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **252**

OFFICIAL NAME	Portugal - Morocco		
OTHER NAMES	ATLAS		
COUNTRY A	Morocco	COUNTRY B	Portugal
TERMINUS A	Asilah	TERMINUS B	Burgau, Lagos
LANDING POINT A	Asilah	LANDING POINT B	Burgau
COORDINATES A	$35^{\circ}28'$ N x $06^{\circ}01'$ W	COORDINATES B	$37^{\circ}04'$ N x $08^{\circ}47'$ W

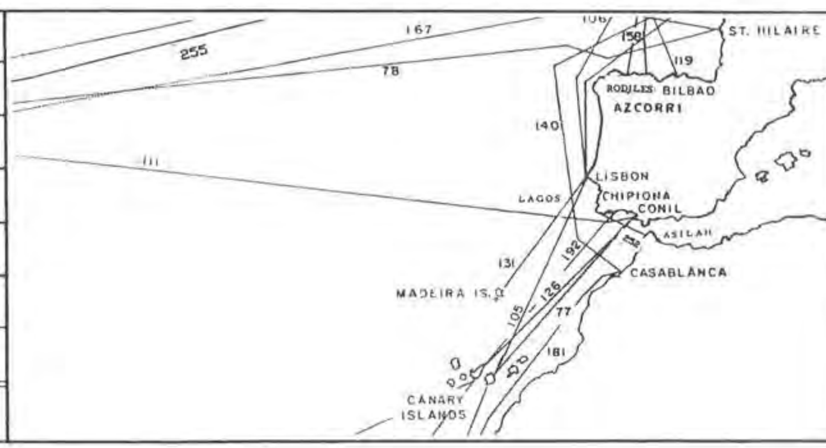
OWNERS	Companhia Portuguesa Rádio Marconi, Société Marocaine de Télécommunications par
	Cable Sous-Marin, Compagnie Francaise de Cables Sous-Marins et de Radio,
	ITALCABLE Servizi Cablografici, Radiotelegrafici et Radioelettrici

DATE IN SERVICE	1982	NATURE OF SERVICE	commercial	CABLE MILES	192	SINGLE OR TWIN	single	SYSTEM TYPE	S 12

CABLE DESCRIPTION	unarmored polyethylene coaxial	CABLE SIZE	1.5" 38.1 mm
CABLE MANUFACTURER	Les Cables de Lyon	CABLESHIP(S) USED	VERCORS
REPEATER DESCRIPTION	monocontainer flexible bidirectional	NUMBER OF REPEATERS	28
REPEATER SPACING	8 nm		
REPEATER MANUFACTURER	CIT-ALCATEL		
NOMINAL TRANSMISSION BANDWIDTH	5196+5196 kHz	TRANSMISSION FREQUENCIES	812-6008+7192-12388 kHz
NUMBER OF EQUALIZERS	1	EQUALIZATION METHOD	remote controlled
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	1260	CHANNEL SPACING, INITIAL	4 kHz
TERMINAL EQUIPMENT MANUFACTURER	CIT ALCATEL	CONSTRUCTION CONTRACTOR	SUBMARCOM
POWER FEED MODE	double end	NOMINAL VOLTAGE	330/330
SYSTEM CURRENT	0.545 A		

TASI TYPE	-	CIRCUITS USED	-	CIRCUITS DERIVED	-	TOTAL CIRCUITS	-	DATE APPLIED	-

COST	$ MILLION
CABLE	4.137
SUBMERGED ELECTRONICS	2.840
TERMINAL AND POWER FEED	1.442
TERMINAL STATIONS	1.390
INSTALLATION	1.880
TOTAL	11.689
SYSTEM DESIGN LIFE	25 years



252
Unassigned

SEACABLE SYSTEM DATA PROFILE

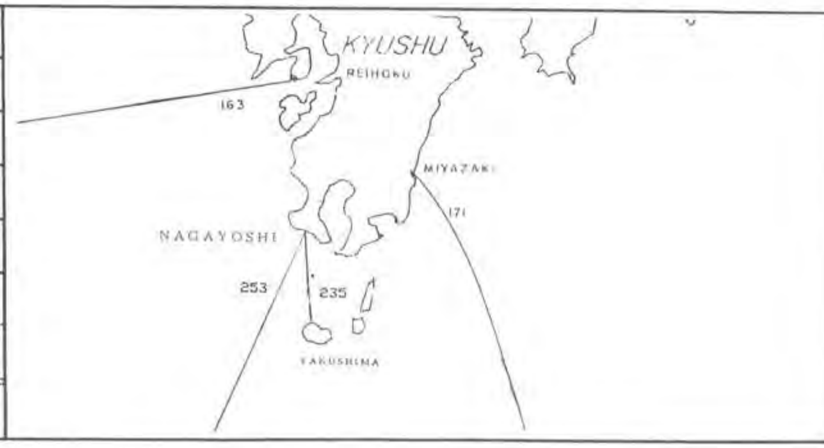
SYSTEM REFERENCE NUMBER **253**

OFFICIAL NAME	Kagoshima - Naze	ACRONYM	
OTHER NAMES			
COUNTRY A	Japan	COUNTRY B	Japan
TERMINUS A	Nagayoshi	TERMINUS B	Asani
LANDING POINT A	Fukiagehama, Kagoshima	LANDING POINT B	Naze, Amamioshima
COORDINATES A	$31^{o}33'$ N x $130^{o}20'$ E	COORDINATES B	$28^{o}33'$ N x $129^{o}21'$ E

OWNER A	Nippon Telegraph and Telephone Public Corporation	CIRCUITS HELD	all
OWNER B		CIRCUITS HELD	
I R U HOLDERS			
CIRCUITS HELD			
LESSEES			
CIRCUITS LEASED			

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	246	SINGLE OR TWIN	single	SYSTEM TYPE	CS36MD1
CABLE DESCRIPTION	unarmored polyethylene coaxial					CABLE SIZE	1.00" 25.4 mm 1.50" 38.1 mm		
CABLE MANUFACTURER	Ocean Cable Company Ltd.					CABLESHIP(S) USED	KUROSHIO MARU TSUGARU MARU		
REPEATER DESCRIPTION	monocontainer flexible bidirectional			NUMBER OF REPEATERS	83	REPEATER SPACING	2.4 nm 3.4 nm		
REPEATER MANUFACTURER	Fujitsu Ltd. and NEC Corporation								
NOMINAL TRANSMISSION BANDWIDTH	12672+12672 kHz	TRANSMISSION FREQUENCIES	4332-17004+22796-35469 kHz						
NUMBER OF EQUALIZERS	3	EQUALIZATION METHOD	magnetic external stepping						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	2700	CHANNEL SPACING, INITIAL	4 kHz						
TERMINAL EQUIPMENT MANUFACTURER	Fujitsu Ltd. and NEC Corp.	CONSTRUCTION CONTRACTOR	NTTPC						
POWER FEED MODE	double end	NOMINAL VOLTAGE	1000/1000	SYSTEM CURRENT	0.156 A				
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **254**

OFFICIAL NAME	Greece - Egypt	ALEXANDROS	
OTHER NAMES			
COUNTRY A	Greece	COUNTRY B	Egypt
TERMINUS A	Athens (Lagonissi)	TERMINUS B	Alexandria
LANDING POINT A	Anavissos	LANDING POINT B	Alexandria
COORDINATES A	37°4 'N x 23°5 'E	COORDINATES B	31°1 "N x 29°5 'E

OWNER A	Hellenic Telecommunications Organization OTE	CIRCUITS HELD	624 h
OWNER B	Arab Republic of Egypt National Telecommunications Organization	CIRCUITS HELD	624 h

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	5	SINGLE OR TWIN	single	SYSTEM TYPE	SF

CABLE DESCRIPTION unarmored polyethylene coaxial — CABLE SIZE 1.50" 38.1 mm

CABLE MANUFACTURER Simplex Wire and Cable Company — CABLESHIP(S) USED LONG LINES

REPEATER DESCRIPTION monocontainer bidirectional flexible — NUMBER OF REPEATERS 62 — REPEATER SPACING 10 nm

REPEATER MANUFACTURER Western Electric Company

NOMINAL TRANSMISSION BANDWIDTH 2160+2160 kHz — TRANSMISSION FREQUENCIES 554-2920+3578-5894 Khz

NUMBER OF EQUALIZERS 1 — EQUALIZATION METHOD switched networks

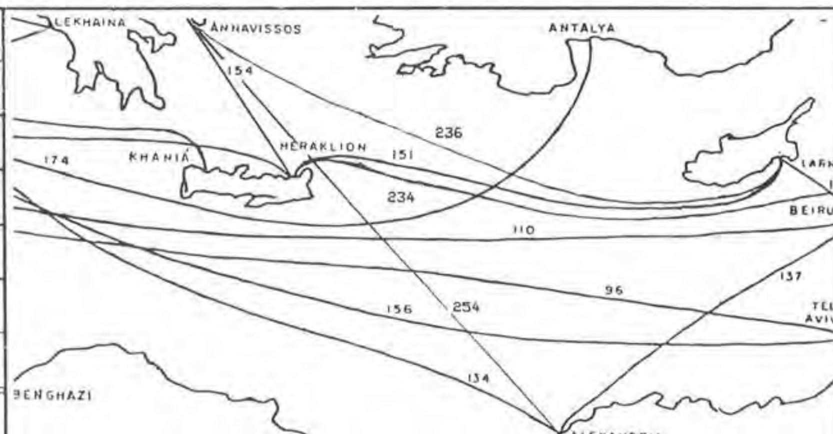
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL 624 — CHANNEL SPACING, INITIAL 4 kHz

TERMINAL EQUIPMENT MANUFACTURER Western Electric Company — CONSTRUCTION CONTRACTOR ATT International

POWER FEED MODE double end — NOMINAL VOLTAGE — SYSTEM CURRENT 0.136 A

TASI TYPE - CIRCUITS USED - CIRCUITS DERIVED - TOTAL CIRCUITS - DATE APPLIED -

COST	$ MILLION
CABLE	14.0
SUBMERGED ELECTRONICS	8.8
TERMINAL AND POWER FEED	3.4
TERMINAL STATIONS	-
INSTALLATION	7.8
TOTAL	34.0
SYSTEM DESIGN LIFE	25 years



SEACABLE SYSTEM DATA PROFILE

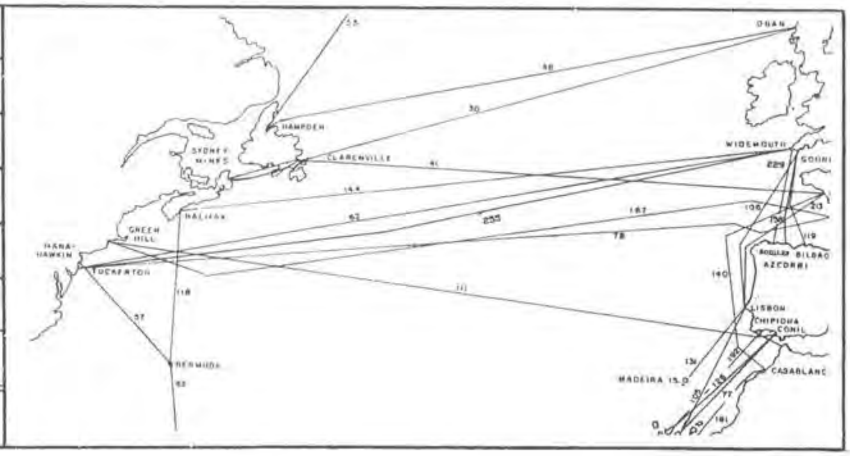
SYSTEM REFERENCE NUMBER **255**

OFFICIAL NAME	Transatlantic 7	ACRONYM	TAT 7
OTHER NAMES	Tuckerton - Lands End		
COUNTRY A	United States	COUNTRY B	United Kingdom
TERMINUS A	Tuckerton, New Jersey	TERMINUS B	Lands End
LANDING POINT A	Beach Haven	LANDING POINT B	Porthcurno
COORDINATES A	39°33' N x 74°14' W	COORDINATES B	50°03' N x 06°39' W

Participation is approximately 40% by U.S. entities including AT&T, ITTWC, RCAGC, WUI, FTCC, and TRT, and by TGC, with approximately 22% by BTI and the remainder by 17 European administrations.

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	3277	SINGLE OR TWIN	single	SYSTEM TYPE	SG
CABLE DESCRIPTION	Unarmored polyethylene coaxial					CABLE SIZE	1.70" 43.2 mm		
CABLE MANUFACTURERS	STC, Cables de Lyon, and Simplex					CABLESHIP(S) USED	LONG LINES, VERCORS MONARCH		
REPEATER DESCRIPTION	Monocontainer flexible bidirectional solid state					NUMBER OF REPEATERS	660	REPEATER SPACING	5.1 nm
REPEATER MANUFACTURER	Western Electric Company								
NOMINAL TRANSMISSION BANDWIDTH	12000+12000 kHz			TRANSMISSION FREQUENCIES	1.0 - 13.5 + 16.7 - 29.3 Mhz				
NUMBER OF EQUALIZERS		EQUALIZATION METHOD	remote control						
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL	4200					CHANNEL SPACING, INITIAL	3 kHz		
TERMINAL EQUIPMENT MANUFACTURER	Western Electric Company					CONSTRUCTION CONTRACTOR	ATT		
POWER FEED MODE	double end	NOMINAL VOLTAGE	5150/5150			SYSTEM CURRENT	0.657 A		
TASI TYPE		CIRCUITS USED		CIRCUITS DERIVED		TOTAL CIRCUITS		DATE APPLIED	

COST	$ MILLION
CABLE	116.0
SUBMERGED ELECTRONICS	49.3
TERMINAL AND POWER FEED	9.3
TERMINAL STATIONS	2.0
INSTALLATION AND OTHER	3.4
TOTAL	180.0
SYSTEM DESIGN LIFE	25 years



SPECIAL FORMAT FOR FIBER-OPTIC SYSTEMS

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **256**

OFFICIAL NAME	British Deep-Sea Trial
OTHER NAMES	
COUNTRY	United Kingdom
TERMINUS	Ship Loop

OWNER	British Telecom International and STC Submarine Systems Ltd.

DATE IN SERVICE	1983	NATURE OF SERVICE	experimental	CABLE MILES		SYSTEM TYPE DESIGNATION	NL 1
CABLE DESCRIPTION							
						CABLE O. D.	
CABLE MANUFACTURER	STC Submarine Systems Ltd.			CABLESHIP(S) UTILIZED			
NUMBER OF REGENERATORS	1	REGENERATOR TYPE DESIGNATION	NL 1			REGENERATOR SPACING	
REGENERATOR DESCRIPTION				REGENERATOR MANUFACTURER	STC Submarine Systems Ltd.		
TERMINAL EQUIPMENT MANUFACTURER		STC Submarine Systems Ltd.					
NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL				NOMINAL CHANNEL SPACING, INITIAL			
TRANSMISSION WAVELENGTH	1.3	TRANSMISSION BIT-RATE		CONSTRUCTION CONTRACTOR	STC SSL		
POWER FEED MODE		NOMINAL VOLTAGE		SYSTEM CURRENT			

COST EXPERIMENTAL $ MILLION	
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	

SEACABLE SYSTEM DATA PROFILE

SYSTEM REFERENCE NUMBER **257**

OFFICIAL NAME	Larne - Port Patrick		
OTHER NAMES			
COUNTRY A	U. K. (Northern Ireland)	COUNTRY B	U. K. (Scotland)
TERMINUS A	Larne	TERMINUS B	Port Patrick
LANDING POINT A	Drains Bay	LANDING POINT B	Port Mora
COORDINATES A		COORDINATES B	

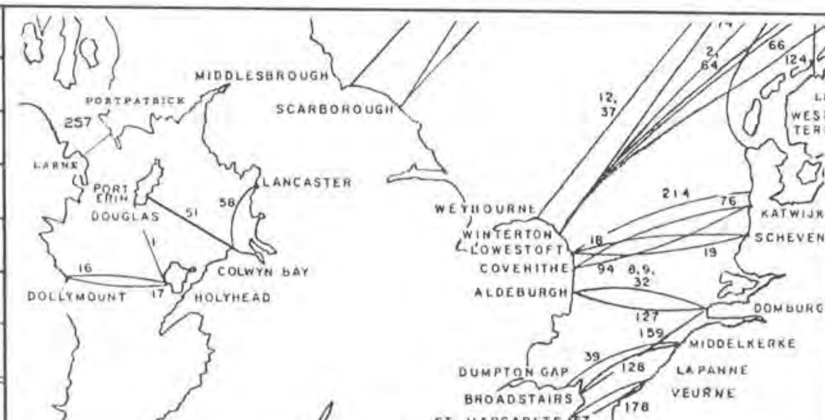
OWNER A	British Telecom International	CIRCUITS HELD	all

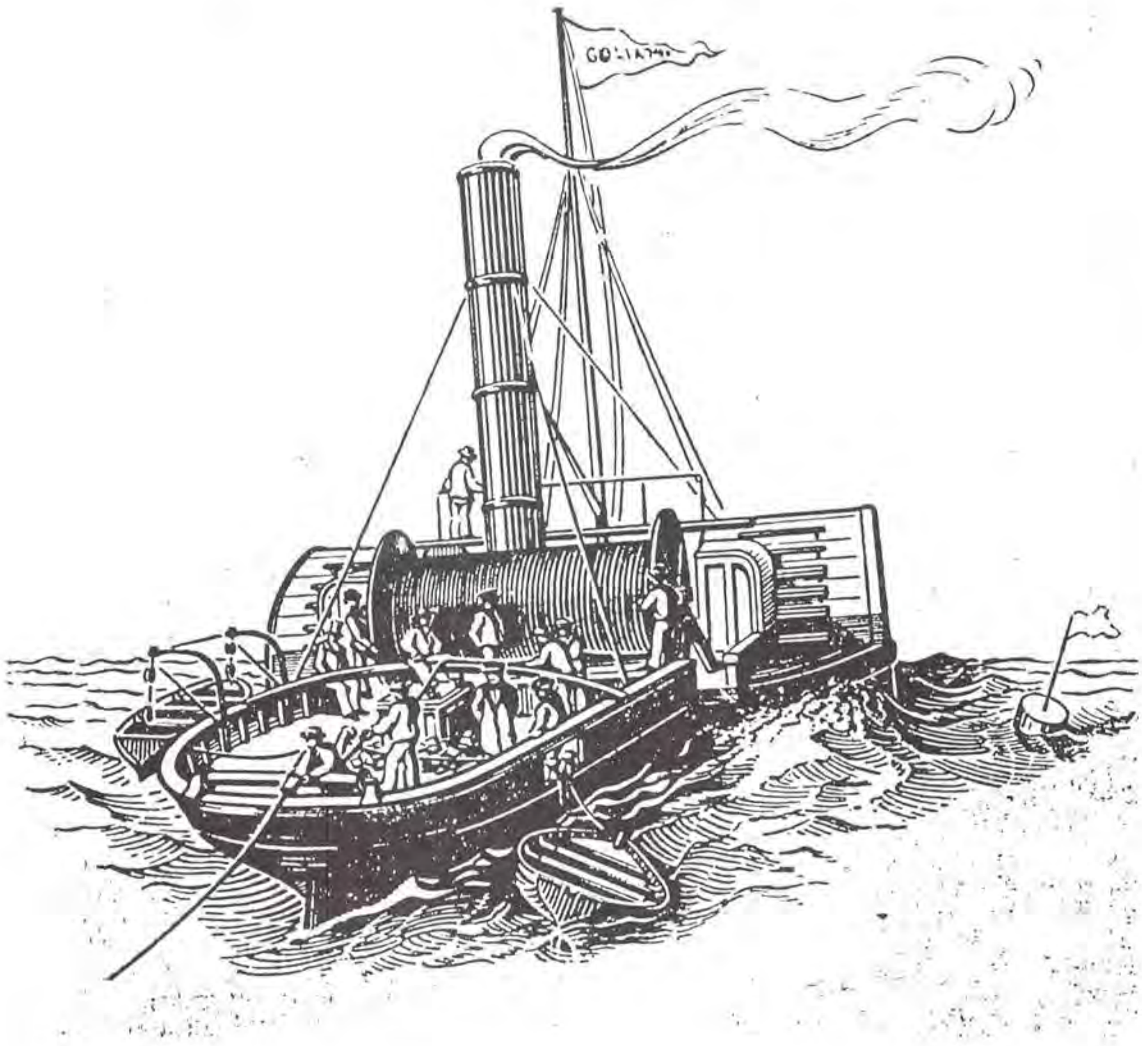
In 1983 a portion of the former Covehithe - Katwijk B system (No. 94, retired that year) was recovered and re-laid by IRIS (3). Repeaters employed were 2 un-used spares plus 1 re-covered; terminal station installations utilized un-used equipment on hand.

DATE IN SERVICE	1983	NATURE OF SERVICE	commercial	CABLE MILES	24	SINGLE OR TWIN	single	SYSTEM TYPE	T

- CABLE DESCRIPTION: armored polyethylene coaxial — CABLE SIZE: 0.935" 23.7 mm
- CABLE MANUFACTURER: Submarine Cables Ltd. (1967 production) — CABLESHIP(S) USED: IRIS (3)
- REPEATER DESCRIPTION: monocontainer inflexible bidirectional transistorized — NUMBER OF REPEATERS: 3 — REPEATER SPACING: 7.5 nm
- REPEATER MANUFACTURER: Submarine Cables Ltd. (1967 production)
- NOMINAL TRANSMISSION BANDWIDTH: 1980+1980 kHz — TRANSMISSION FREQUENCIES: 312-2296+2792-4776 kHz
- NUMBER OF EQUALIZERS: none — EQUALIZATION METHOD: -
- NOMINAL VOICE CIRCUIT CAPACITY, NON-TASI, INITIAL: 480 — CHANNEL SPACING, INITIAL: 4 kHz
- TERMINAL EQUIPMENT MANUFACTURER: Associated Electrical Industries (1967) — CONSTRUCTION CONTRACTOR: BTI
- POWER FEED MODE: double end — NOMINAL VOLTAGE: 100/100 — SYSTEM CURRENT: 0.150 A
- TASI TYPE: - — CIRCUITS USED: - — CIRCUITS DERIVED: - — TOTAL CIRCUITS: - — DATE APPLIED: -

COST not relevant	$ MILLION
CABLE	
SUBMERGED ELECTRONICS	
TERMINAL AND POWER FEED	
TERMINAL STATIONS	
INSTALLATION	
TOTAL	
SYSTEM DESIGN LIFE	expected 20 years





The first submarine cable of consequence was installed in 1850 between Dover and Calais. Here the paddle tug GOLIATH is seen bucking the channel chop with a monstrous spool of cable carried 'thwartships above the deck. The telegraph cable actually functioned for a few days before succumbing to an incident occurring all too frequently in the early cable days: it was cut by a curious fisherman.

This book contains detailed information on all submarine telephone cable systems meeting the previously-described criteria for inclusion, that were in service by the end of 1983. Additionally, there are nine projects under way that will have been completed in 1984, expected to come into service during the preparation of this volume. They are described in the degree of detail available.

Beyond 1984 there are thirteen other projects committed for construction that are in varying stages of preparation, to come into service during 1985 through 1988. Further, there are scores of projects that have come into consideration by one means or another, that have not yet reached the stage of agreement to merit categorization as "committed". Some are "pending", meaning that negotiations among the potential owners are in progress; others are "deferred", those still under consideration but upon which action has been suspended.

Finally there is a great collection of projects once considered but no longer pursued, or that have been rendered unnecessary by construction of other facilities serving the originally-perceived needs for traffic, which are categorized as "indefinite". Also in this group are those speculative projects foreseen as possibly necessary at some future time, often promoted--quite reasonably--by the seacable system manufacturers and construction contractors.

A word about project identification is in order: to avoid the ambiguities at risk in any scheme of listing and indexing, each discrete project (whether one link between two destinations or a series of links to carry traffic between several locations along the route) is given a project reference number which is retained until the result of the project--the completed system-- is put into service. When a project becomes identifiable, through releases to technical or financial media or from other sources judged reliable, the number enters the data base, at first serially. Then as more information may accrue about the project, its category within the data system may be altered. These mutations are confined to the inner workings of the data system; however, an inevitable consequence is an accumulation of "unassigned numbers" appearing in the sequential listing. These are purposely left in to maintain flexibility as the status of the project may change.

A "project" graduates into a "system" when installation is finished and the facility is placed into service.

* * * *

The following tabulations are, first, a listing of projects by category, i. e., pending, deferred, etc., in roughly chronological order. This is followed by an index of project geographic identification in alphabetic order.

Sometimes the distance between landing points of a transoceanic cable requires a length of cable greater than can be carried by the chosen cable-laying ship. In such instances the cable is laid in sequential segments, and the laying vessel attaches an anchor and a buoy, and streams a "recovery tail" to the end of a laid segment. The ship then returns to factory or depot, loads the next segment, returns to the site, recovers the buoy and cable end, joins the recovered end to the beginning of the next segment, and proceeds with the laying. Here is a view of a cable buoy being prepared for launching on KDD MARU.

LIST OF COMMITTED, PENDING, DEFERRED, AND INDEFINITE PROJECTS

By Category, and in Approximate Chronological Order, From January 1, 1984 Onward

CATEGORY	SITUATION	PROJECT REFERENCE NUMBERS
COMMITTED	UNDER CONSTRUCTION, UNDER CONTRACT, UNDER OWNERS' AGREEMENT TO BUILD	258 - 284
PENDING	DURING NEGOTIATIONS BETWEEN POTENTIAL OWNERS FOR AGREEMENT TO BUILD	285 - 308
DEFERRED	STILL UNDER CONSIDERATION BY POTENTIAL OWNERS, BUT ACTION SUSPENDED	309 - 332
INDEFINITE	PROJECT ONCE PROPOSED OR CONSIDERED, BUT WITH NO ENSUING AGREEMENT TO BUILD, OR SUPERCEDED BY OTHER CONSTRUCTION; ALSO CONTEMPLATED POSSIBLE FUTURE REQUIREMENTS	333 - 429

COMMITTED PROJECTS

PROJECT REFERENCE NUMBER	IDENTIFICATION	SCHEDULED SERVICE DATE
258	BAHRAIN - QATAR - U.A.E. MANAMA - SUMAISMAH - ABU DHABI	1984
259	SPAIN - BELGIUM "MERIDIAN" VILLAVICIOSA - VEURNE	1984
260	JAPAN NINOMIYA - OKINAWA	1984
261	CANADA - HAWAII - FIJI - NORFOLK NEW ZEALAND - AUSTRALIA "ANZCAN"	1984
262	U.K. - NETHERLANDS 11 ALDEBURGH - DOMBURG	1984
263	NUMBER UNASSIGNED	
264	JAPAN DEEP-SEA TRIAL NO. 1 (FIBER OPTIC)	1984
265	FRANCE PORT GRIMAUD - ANTIBES (FIBER OPTIC)	1984
266	GRAND CAYMAN - CAYMAN BRAC TURTLE BEACH - CAYMAN BRAC	1984
267	MALAYSIA - INDONESIA PENANG - MEDAN	1984
268	NUMBER UNASSIGNED	
269	SINGAPORE - HONG KONG - CHINA, REP OF "ASEAN S-H-T" CHANGI - DEEP WATER BAY - TOUCHENG	1985
270	U.K. - BELGIUM 5 BROADSTAIRS - OOSTENDE (FIBER OPTIC)	1985
271	NUMBER UNASSIGNED	
272	NUMBER UNASSIGNED	
273	SPAIN (CANARY ISLANDS) ALTAVISTA - CANDELARIA (FIBER OPTIC)	1985
274	FRANCE MAINLAND - CORSICA (FIBER OPTIC)	1985
275	MALAYSIA KUCHING - KOTA KINABULU	1985
276	AUSTRALIA - INDONESIA - SINGAPORE "ASEAN A-I-S" PERTH - JAKARTA - CHANGI	1986
277	NUMBER UNASSIGNED	
278	PHILIPPINE REP - MALAYSIA - THAILAND CURRIMAO - KOTA KINABULU - SONGKHLA	1987
279	PAKISTAN - U.A.E KARACHI - FUJAIRAH	1987
280	BAHRAIN - KUWAIT	1987
281	INDIA - U.A.E. BOMBAY - FUJAIRAH	1987
282	U.S. - EUROPE "TAT 8" (FIBER OPTIC) TUCKERTON - BRANCHING UNIT; THENCE TO WIDEMOUTH AND TO PENMARC'H	1988
283	FRANCE - PORTUGAL PENMARC'H - SESIMBRA	1988
284	SINGAPORE - MARSEILLE "SEA-ME-WE" TOTAL PROJECT (SINGAPORE - MEDAN PORTION 1984) (DJIBOUTI - JEDDAH PORTION 1985) (MEDAN - COLOMBO PORTION 1985) (COLOMBO - DJIBOUTI PORTION 1986) (JEDDAH - SUEZ PORTION 1986) (ALEXANDRIA - PALERMO POR. 1987) (PALERMO - MARSEILLE PORTION 1988)	1988

PENDING PROJECTS

PROJECT REFERENCE NUMBER	IDENTIFICATION
285	UNITED STATES FLORIDA - VIRGIN IS. 4 (FIBER OPTIC)
286	U.S. (HAWAII) - MARCUS IS.; THENCE BRANCHING TO GUAM AND JAPAN "TPC 3" (FIBER OPTIC)
287	NUMBER UNASSIGNED
288	ITALY - LIBYA CATANIA - TRIPOLI
289	U.S. (FLORIDA) - DOMINICAN REP - JAMAICA FLORIDA CITY - PUERTO PLATA - KINGSTON (FIBER OPTIC)
290	ITALY - MOROCCO PISA - TETOUAN
291	U.S. (GUAM) - PHILIPPNE REP 2 AGANA - BALER (FIBER OPTIC)
292	NUMBER UNASSIGNED
293	U.S. (FLORIDA) - HONDURAS FLORIDA CITY - PUERTO CORTES (FIBER OPTIC)
294	U.S. (VIRGIN IS.) - VENEZUELA 3 (FIBER OPTIC)
295	NUMBER UNASSIGNED
296	NUMBER UNASSIGNED
297	DENMARK NYKOBING - RONNE
298	MALAYSIA KUANTAN - KUCHING 2
299	JAMAICA - PANAMA - COLOMBIA (FIBER OPTIC)
300	U.S. - JAMAICA (FIBER OPTIC)
301	U.S. - EUROPE "TAT 9" (FIBER OPTIC)
302	UNITED STATES MAINLAND - HAWAII "HAW 4" (FIBER OPTIC)
303	IVORY COAST - SENEGAL 2
304	FRENCH SOMALIA - OMAN
305	NUMBER UNASSIGNED
306	DENMARK - POLAND 2 (FIBER OPTIC)
307	JAPAN - HONG KONG (OR PHILIPPINE REP)
308	ITALY ROME - SARDINIA

DEFERRED PROJECTS

PROJECT REFERENCE NUMBER	IDENTIFICATION
309	ITALY - GREECE 3 CATANIA - LEKHAINA
310	ITALY - TUNISIA 2 NAPLES - TUNIS
311	SPAIN - ALGERIA 2 PALMA - BORDJ-EL-KIFFAN
312	ISRAEL - ITALY 2
313	NUMBER UNASSIGNED
314	SPAIN - FRANCE BARCELONA - MARSEILLE
315	SPAIN - GREECE
316	NIGERIA LAGOS - PORT HARCOURT
317	NUMBER UNASSIGNED
318	JAPAN HACHIJO - OGASAWARA
319	NIGERIA - CAMEROUN
320	NUMBER UNASSIGNED
321	MALAYSIA - PHILIPPINE REP
322	NUMBER UNASSIGNED
323	NUMBER UNASSIGNED
324	NUMBER UNASSIGNED
325	FRANCE - ALGERIA 5 (FIBER OPTIC)
326	NUMBER UNASSIGNED
327	COSTA RICA - EL SALVADOR
328-332	NUMBERS UNASSIGNED

PROJECTS WITH INDEFINITE STATUS

PROJECT REFERENCE NUMBER	IDENTIFICATION
333	ISRAEL - LEBANON
334	CANADA - GREENLAND
335	NUMBER UNASSIGNED
336	PHILIPPINE REP - VIET NAM
337	NUMBER UNASSIGNED
338	NUMBER UNASSIGNED
339	NUMBER UNASSIGNED
340	MOROCCO - EASTERN MED "MAGHREB - MASHREK"
341	JAPAN SHIKOKU - KYUSHU (HARUO - NAOTAKE IDE)
342	SPAIN - ITALY 5 BARCELONA - ROME
343	SINGAPORE - MALAYSIA KATONG - PENANG
344	SPAIN (NORTH COAST) - FRANCE
345	SPAIN - ITALY 6
346	CANADA - U.K. "CANTAT 3" (FIBER OPTIC)
347	U.S.(GUAM) - CHINA, PEOPLE'S REP OF AGANA - SHANGHAI
348	GREECE ATTICA - SYROS
349	GERMANY - U.K. 4
350	JAMAICA - TORTOLA
351	PAKISTAN - SRI LANKA
352	SYRIA - EGYPT
353	TURKEY - LEBANON
354	U.K. - IRELAND 3 (FIBER OPTIC)
355	U.K. - NORWAY 3
356	SPAIN - MOROCCO
357	NUMBER UNASSIGNED
358	JAPAN HONSHU - BONIN ISLANDS
359	PORTUGAL SESIMBRA - PONTA DELGADA
360	EGYPT - GREECE ALEXANDRIA - HERAKLION (CRETE)
361	TRINIDAD - GUYANA
362	CYPRUS - SYRIA
363	INDONESIA - PHILIPPINE REP
364	U.S.(VIRGIN IS) - COSTA RICA
365	IRAN BANDA ABBAS - CHABAHAR
366	VIET NAM - SINGAPORE
367	SAMOA - SOLOMONS
368	SPAIN MAINLAND - CANARY IS "PENCAN 4" (FIBER OPTIC)
369	JAPAN HONSHU - SHIKOKU
370	VENEZUELA - NETHERLANDS WEST INDIES CARACAS - CURACAO
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373	EUROPE - SOUTH AMERICA (FIBER OPTIC)
374	U.K. - BELGIUM 6 (FIBER OPTIC)
375	U.K. - DENMARK 4 (FIBER OPTIC)
376	DENMARK - IRELAND (FIBER OPTIC)
377	GERMANY - SWEDEN 4 (FIBER OPTIC)
378	DENMARK - NORWAY 5 (FIBER OPTIC)
379	DENMARK DOMESTIC (FIBER OPTIC)
380	SWEDEN DOMESTIC (FIBER OPTIC)
381	SWEDEN - GERMANY DEM. REP. (FIBER OPTIC)
382	SWEDEN - FINLAND (FIBER OPTIC)
383	NETHERLANDS - DENMARK 5 (FIBER OPTIC)
384	SPAIN PALMA - BARCELONA "PENBAL 3" (FIBER OPTIC)
385	SPAIN PALMA - IVIZA (FIBER OPTIC)
386	SPAIN (MALLORCA) - ITALY (SICILY) (FIBER OPTIC)
387	FRANCE - PORTUGAL - MOROCCO (FIBER OPTIC)
388	ITALY ROME - PALERMO 2 (FIBER OPTIC)
389	SPAIN - ARGENTINA
390	GREECE - CYPRUS - EGYPT (FIBER OPTIC)
391	ITALY - TURKEY 2 (FIBER OPTIC)
392	FRANCE - GREECE 3 (FIBER OPTIC)
393	BERMUDA - TORTOLA 2
394	NUMBER UNASSIGNED
395	NUMBER UNASSIGNED
396	DOMINICAN REP - U.S.(PUERTO RICO / VIRGIN IS.) (FIBER OPTIC)
397	HONG KONG - JAPAN (FIBER OPTIC)
398	CHINA, REP OF DOMESTIC (FIBER OPTIC)
399	KOREA DOMESTIC (FIBER OPTIC)
400	CHINA, REP OF - U.S.(GUAM) "TAIGU 2" (FIBER OPTIC)
401	PHILIPPINE REP DOMESTIC (FIBER OPTIC)
402	SINGAPORE - BRUNEI (FIBER OPTIC)
403	INDONESIA DOMESTIC (FIBER OPTIC)
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405	PHILIPPNE REP - SINGAPORE "PHILSIN 2" (FIBER OPTIC)
406	INDIA - SRI LANKA BOMBAY - COLOMBO
407	U.S.S.R. DOMESTIC (FIBER OPTIC)
408	MALAYSIA DOMESTIC (FIBER OPTIC)
409	ITALY - GREECE 4 BARI - LEKHAINA (FIBER OPTIC)
410	NUMBER UNASSIGNED
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416	UNITED STATES FLORIDA - PUERTO RICO 2
417	SAUDI ARABIA - SUDAN
418	HONG KONG - MALAYSIA - SINGAPORE
419	U.S.(VIRGIN IS) - COLOMBIA
420	SPAIN - GULF OF GUINEA
421	U.S.(GUAM) - JAPAN (OKINAWA) AGANA - CHINEN

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425	UNITED STATES VIRGIN IS - PUERTO RICO
	UNITED KINGDOM
426	WALES - ISLE OF MAN (FIBER OPTIC)
427	ENGLAND - ISLE OF WIGHT (FIBER OPTIC)
428	NORTH SEA POINT(S) (FIBER OPTIC)
429	WALES - NORTHERN IRELANS (FIBER OPTIC)

ALPHABETIC INDEX OF ALL COMMITTED, PENDING, DEFERRED, AND INDEFINITE PROJECTS

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COMMITTED	UNDER CONSTRUCTION, UNDER CONTRACT, UNDER OWNERS' AGREEMENT TO BUILD
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PENDING	DURING NEGOTIATIONS BETWEEN POTENTIAL OWNERS FOR AGREEMENT TO BUILD
	PROJECT REFERENCE NUMBERS 285 THROUGH 308
DEFERRED	STILL UNDER CONSIDERATION BY POTENTIAL OWNERS, BUT ACTION SUSPENDED
	PROJECT REFERENCE NUMBERS 309 THROUGH 327
INDEFINITE	PROJECT ONCE PROPOSED OR CONSIDERED, BUT WITH NO ENSUING AGREEMENT TO BUILD, OR SUPERSEDED BY OTHER CONSTRUCTION; ALSO CONTEMPLATED POSSIBLE FUTURE REQUIREMENTS
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V

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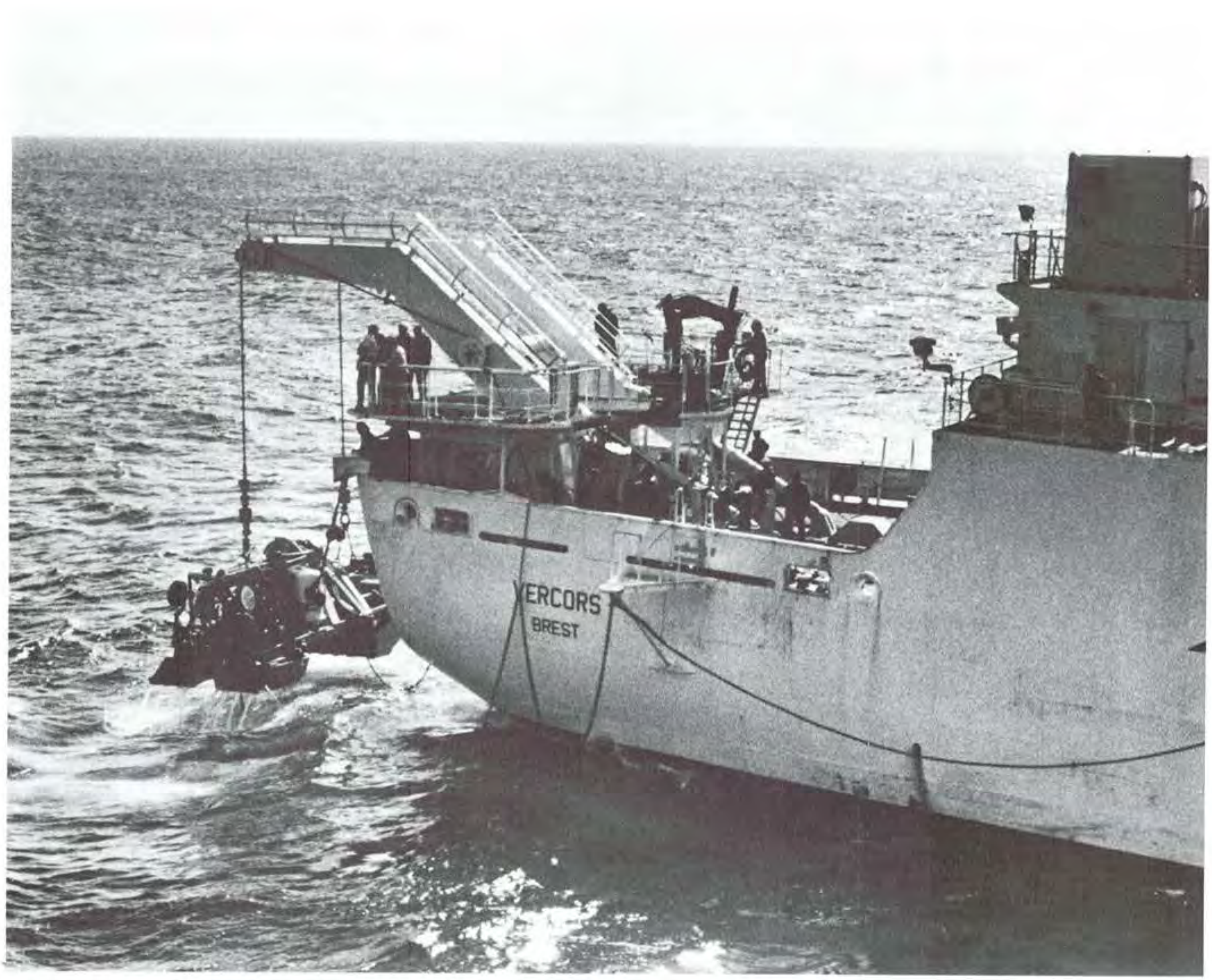
END



It is the general practice today to embed the cables beneath the sea-floor in water depths at which man-initiated activities such as trawling and dredging could disturb them. Here French cableship VERCORS has a sea-bottom plow at the stern ready for deployment to bury a portion of Transatlantic No. 6.

DESCRIPTIONS OF COMMITTED PROJECTS

1984 - 1988

Project Reference Numbers 258 - 284

Project Reference Number — Description

258 Bahrain - Qatar - U. A. E.

From Manama the 1.50-inch 116-mile coaxial cable with 18 repeaters stretches to Sumaismah, Qatar, and then 196 miles to Abu Dhabi in the U. A. E. Using cable made by Ocean Cable Company Ltd. and electronics by themselves and NEC, the project was carried out by Fujitsu using cableship IRIS (3). The system provides 1200 circuits at 4 kHz spacing and is to be completed in 1984.

259 Spain - Belgium

Named MERIDIAN, this project is a joint effort of CTNE and Belgium, Netherlands, and the FRG. The 1.47-inch coaxial, provided by Les Cables de Lyon, runs 723 miles from Rodiles on the north coast of Spain to St. Idesbald on the Belgian coast near Veurne, with 159 repeaters approximately 5.3 miles apart. The system, a French S 25/3, was installed by SUBMARCOM using electronics supplied by CIT-ALCATEL. It provides initially 2580 circuits at 4 kHz, and is scheduled to go into service in 1984. The cableship used: VERCORS.

260 Ninomiya - Okinawa

Called "The Okinawa Cable", the 1.5-inch coaxial runs 930 miles from the coast of Honshu to Gushikama, with 139 repeaters spaced about 7 miles apart. The cable for the CS 12M system was produced by OCC and the electronics to accommodate 1600 circuits at 3 kHz were supplied by NEC and Fujitsu. The system is owned by KDD who acted as prime contractor, using their cableship KDD MARU for the project. The scheduled service date is 1984.

261 Canada - Hawaii - Fiji - Norfolk - New Zealand - Australia

One of the largest single undertakings of a multi-link transocean system, the project is designated "ANZCAN". It consists of 4 links of 1.47-inch coaxial cable produced by STC, beginning at Vancouver and running for 2487 miles to Hawaii, with 343 repeaters, then 3033 miles to Fiji, with 416 repeaters, then 985 miles to Norfolk Island with 138 repeaters, and to Sydney 928 miles with 138 repeaters. The main run just described is a British NE system produced and installed by STC to provide 1380 circuits at 4 kHz. Cableships MERCURY and CABLE VENTURE were used.

From Norfolk there is a 1.00-inch coaxial made by OCC running 654 miles, with 137 repeaters, to Auckland. It is a Japanese CS 5M system with electronics by Fujitsu and NEC, giving 480 4 kHz-spaced circuits.

The Vancouver - Hawaii portion was finished first, in 1983, and the remainder of the project is scheduled for completion in 1984.

Participation in the project is widely distributed, the owners being TGC, NZPO, OTC(A), FINTEL, BTI, PTT France, DBP, Papua NG, KDD, PLDT, and C&W.

264 KDD First Deep Sea Trial (Fiber Optic)

This 1984 experimental installation was placed in a water depth of over 7000 meters to the southeastward of Honshu. Conducted by KDD using their cableship KDD MARU, the 24-km cable, containing 6 single-mode fibers, was made by OCC and the 2 regenerators were supplied by Fujitsu and NEC.

265 Port Grimaud - Antibes (Fiber Optic)

Under the auspices of CNET this 1984 experimental installation of a 44-km cable was carried out by SUBMARCOM using cableship RAYMOND CROZE. Two regenerators produced by CIT-ALCATEL were installed in the S 280 system. Operating at 1.3 μm and 280 Mbps per fiber, it provides for 7690 circuits.

266 Grand Cayman - Cayman Brac

The 120-mile installation, known locally as The Brac Connection, is being carried out by C&W using 0.99-inch coaxial cable and electronics by STC. To be placed in service before the end of 1984, the cable-laying was to be performed by C&W's cableship CABLE VENTURE.

267 Medan - Penang

A joint project by P. T. Indonesian Satellite Corporation and Jabatan Telekom Malaysia, the installation was carried out by NEC using cableship KUROSHIO MARU. The 162-mile 1.0-inch coaxial cable was produced by OCC and the 20 repeaters in it were the contribution of both NEC and Fujitsu. Service is scheduled for 1984.

Project Reference Number	Description

269 Singapore - Hong Kong - Toucheng

Known also as ASEAN S-H-T, the Singapore-Hong Kong link will be composed of 1585 miles of 1.47-inch coaxial cable with 221 repeaters, to be produced by STC and installed in 1985 by cableship CABLE VENTURE. The system is a British NE producing 1380 circuits at 4 kHz.

From Hong Kong to the Republic of China on Taiwan the 1.00-inch coaxial, to be produced by OCC and equipped with 89 repeaters by Fujitsu and NEC, will be installed by Fujitsu in 1985.

270 U.K. - Belgium 5 (Fiber Optic)

To run the 65 miles from Broadstairs to Oostende, the cable will use single-mode fibers and have three regenerators, all provided by STC. The system will operate initially in 1985 as an experimental installation, providing 11,520 circuits, to be put into commercial service sometime thereafter.

273 Las Palmas - Tenerife (Fiber Optic)

AT&T has contracted with CTNE to provide a cable with 6 monomode fibers for the 65-mile stretch between Las Palmas and Tenerife. The system will require 3 regenerators for an initial capacity of 7680 circuits, and is to go into service in 1985.

274 Mainland (France) - Corsica (Fiber Optic)

The DTRE of France has engaged SUBMARCOM to place a 210-mile fiber optic system between Marseille and Ajaccio using 8 regenerators in a 6-fiber single-mode cable made by Les Cables de Lyon. With electronics by CIT-ALCATEL, the S 280 system will provide 7560 circuits. It is planned to be in operation by the end of 1985

275 Kuching - Kota Kinabulu

Reported to be committed for service by the end of 1985, an analog system is to be installed connecting the above-named Malaysian points.

276 Australia - Indonesia - Singapore

Under a contract signed in July 1984 STC will build and install a British NG analog system affording 1380 circuits at 4 kHz between Perth and Jakarta and then onward to Singapore. Known also as ASEAN A-I-S, the project will be concluded 1986.

278 Thailand - Malaysia - Republic of the Philippines

Reported to be under agreement for service by the end of 1987, an analog system of 1200 circuits is to be placed between Thailand and Malaysia and thence to the Philippines.

279 U.A.E. - Pakistan

Under agreement between the two owners, the analog cable project will be tendered for in 1984 with a projected service date of 1987.

280 Bahrain - Kuwait

Under agreement between the two owners the analog cable project is expected to be in service by 1987.

281 U.A.E. - India

Under agreement between the two owners the analog cable project is expected to be in service by 1987.

282 Transatlantic No. 8

Under contract to AT&T with subcontracts to STC and SUBMARCOM, the project for TAT 8, the first transoceanic fiber optic system, is scheduled for service in 1988. A multi-owner project (at least 28), the cable will run from the U.S. east coast to a point on the continental shelf off the coast of England and France. There a branching device will allow connection to both Britain and France. The first portion of the cable from the U.S. to European waters will be manufactured by Simplex and the regenerators, at about 30-mile spacing, will be furnished by AT&T. From the junction point to England, STC will supply cable and electronics, as will SUBMARCOM for the portion to France. The project service date is 1988.

Project Reference Number	Description

283 France - Portugal 2

A project to provide a second connection between Penmarc'h and Sesimbra is under agreement, for service in 1988.

284 Singapore - Marseille "SEA-ME-WE"

This multi-link, multi-owner project will be one of the largest cable enterprisee ever undertaken. Singapore is to be connected to Medan in 1984 with a French S 25 analog system, 345 miles and 1200 circuits, to be supplied by SUBMARCOM, who are to supply also the system between Egypt and Italy, a 1036-mile S 25 link, the Saudi Arabia-Egypt 696-mile S 25 system, and the Sri Lanka - Djibouti portion, a 2337-mile S 12, and finally the Italy - France portion, of a capacity not presently known. The other parts, Sri Lanka - Indonesia and Djibouti - Jeddah are to be supplied by Fujitsu and STC respectively, a Japanese CS-12M system and a British NE 14M. The entire project, including the overland portion between Suez and Alexandria, is expected to be finished in 1988.

The major maritime nations all make extensive use of submarine cables for national defense. Cableship KATUNJ seen here is typical of the 7 other large ships INGUL, JANA, DONETS, ZEYA, ZNA, TAVDA, and INGURI, of the Soviet Union. Three newer cableships EMBA, NEPRYADVA, and SETUN have been commissioned since 1980.

COMMENTS ON PENDING PROJECTS

Project Reference Numbers 285 - 308

285 U.S. Mainland - Puerto Rico/Virgin Is.

Looking toward future traffic growth and facility requirements in the Caribbean/Gulf of Mexico region, a fourth system from the continental U.S. to either St. Thomas or San Juan, possibly favoring the latter for geographic diversity, is under consideration for service sometime about 1990, likely to be of fiber-optic nature.

286 U.S. - Japan TPC 3

Under active pursuit for some time, TPC 3 is now expected to run from Hawaii to a sub-sea branching device, possibly at or near Marcus Island, with legs to Guam and to Ninomiya on the Island of Honshu. It is anticipated that the system comprising the main cable and the two branches will be an AT&T type SL design.

288 Italy - Libya

Reported to be under active consideration, the analog system would connect from Catania, Sicily to Tripoli, with a projected service date of about 1987.

289 U.S. - Dominican Republic - Jamaica

With foresight for continuing traffic growth, additional facilities to connect from the Florida coast to the Dominican Republic and thence to Jamaica are being considered, along with the overall plans for the region. The links would very likely be fiber optic systems, with service dates in 1987/1988.

290 Italy - Morocco

Stated as "under consideration" by two reliable sources, still the ASST of Italy cannot yet make any positive forecast. The project would connect Pisa and Tetouan; whether fiber-optic or analog is not settled.

291 U.S. - Republic of the Philippines

To parallel the aging Guam - Baler system of 1964, the traffic requirements having long ago exceeded the capacity of the initial link, it is considered likely that the new system would be a fiber-optic design, for service possibly by 1988.

293 U.S. - Central America

For many years a direct link from the continental U.S. to a point on the northeast coast of Central America has been under consideration: first to Guatemala or perhaps Costa Rica, but more lately Honduras is indicated, the project to connect Florida City to Puerto Cortes. A fiber-optic system is thought to be probable, for service estimated by one source as early as 1986.

294 U.S. - Venezuela 3

Hard on the heels of the 1980 project, forecasts of traffic growth and the desirability of facility diversity are causing the active consideration of a third link from either the Virgin Islands or Puerto Rico, probably a fiber-optic system.

297 Denmark Domestic

Although considered "moribund" by one source, and with no comment from the Danish authorities, another source has submitted a proposal for a parallel service to the 1968 Nykobing-Ronne system.

298 Malaysia Domestic

According to one source a Kuantan - Kuching project, obviously to parallel the 1980 system, is being considered, although the Malaysia authorities are silent. It is expected that tenders may be called for in 1985.

299 Jamaica - Panama - Colombia

As part of an overall treatment for the traffic growth and future facility needs of the whole region to the south of the U.S., a project for two fiber-optic links is under active consideration, for service about 1987/1988.

300 U.S. - Jamaica

In connection with general plans for the region, a second Florida - Jamaica system, fiber optic, is being considered for service about 1988/1990.

301 U.S. - Europe TAT 9

The commissioning of TAT 8, to occur in 1988, will almost certainly raise the requirement for TAT 9 for the reason of facility diversity if for no other. A service date of 1992 has been mentioned.

302 U.S. Mainland - Hawaii HAW 4

Under active consideration for service in 1988, HAW 4 would likely be an AT&T SL system. Related of course to TPC 3, HAW 4 is almost certain to go forward soon.

303 Ivory Coast - Senegal 2

It is expected that tenders will be called for in 1985 for a second analog system between Dakar and Abidjan.

304 French Somalia - Oman

There are indications that agreement for this project may be reached within a year or two, for a large-capacity analog system.

305 Denmark - Poland 2

The present 60-circuit Denmark - Poland facility, in service since 1960, has long been of inadequate capacity and it is now under consideration to provide a new system, fiber optic, possibly for service in 1987/1988.

307 Japan - Hong Kong

The project to connect Hong Kong directly to Japan--either to Okinawa or to one of the home islands--has long been under consideration, and it is now forecast that a service date of 1989 is likely, and that the system would probably be of fiber-optic design. If agreement for Hong Kong is not reached, the project may go to the Philippine Republic instead.

308 Italy Domestic

There will be a submission of tenders in 1984 for a large analog system connecting the Italian mainland at a point near Rome to some point on Sardinia, for service probably in 1987.

Cableship MUROTO of the Japan Maritime Defense Agency was commissioned in 1980, and engages in oceanographic research related to defense of Japanese home waters.

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INDOSAT
Jakarta

Ireland

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South Atlantic Cable Company, Pty. Ltd.
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Departamento Internacional
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Sweden

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Swedish Telecommunications Administration
TELEVERKET
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Republique Arabe Syrienne
Damas

Thailand

International Services Division
The Communications Authority of Thailand
Bangkok, 1051

Tunisia

Bureau des Cables Sous-Marins
Direction de Télécommunications
Rue d'Angleterre
Tunis

Turkey

Technical Department
General Directorate of Turkish PTT
Republic of Turkey
Ankara

United Kingdom

British Telecom International
Submarine Cable and Microwave Systems Division
The Holborn Centre
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Cable and Wireless PLC
Cableships and Submarine Systems Division
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United States

AT&T Communications, Inc.
340 Mt. Kemble Avenue
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Defense Communications Agency
Defense Communications System Organization
Washington, D. C. 20305

Eastern Space and Missile Center (AFSC)
Patrick Air Force Base, Florida 32925

FTC Communications, Inc. FTCC
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New York, New York 10038

Hawaiian Telephone Company
P. O. Box 2200
Honolulu, Hawaii 96841

Venezuela

Companía Anonima Nacional Teléfonos de Venezuela CANTV
Apartado Postal 1226
Caracas 101

Comparable in size and power to the largest commercial cableships, U. S. Naval Ship ZEUS (T ARC 7) came into service in 1984. Embodying many innovations, ZEUS has cable payout and recovery machinery duplicated at bow and stern, and like other recently-built cableships, has centralized and automated positioning capability utilizing powerful tunnel thrusters fore and aft together with precise-controlled DC motors on the twin shafts.

ABBREVIATIONS; SHORT NAMES

AACR
All America Cables and Radio, Inc.

AACRPR
All.America Cables and Radio (Puerto Rico)

ASST
Azienda di Stato per i Servizi Telefonici

AT&T
AT&T Communications, Inc.

BPO
British Post Office

BTC
Bahamas Telecommunications Corporation

BTI
British Telecommunications International

C&W
Cable and Wireless PLC

C&WHK
Cable and Wireless (Hong Kong) Ltd.

CANTV
Cía. Anónima Nacional de Teléfonos de Venezuela

CAT
Communications Authority of Thailand

CDT
Cía. Dominicana de Teléfonos

CH
Canton Helvetie (Switzerland)

CIT
Cie. Industrielle de Télécommunications

CNET
Centre National d'Etudes de Télécommunications

CODETEL
Cía. Dominica de Teléfonos

COTC
Canadian Overseas Telecommunications Corporation

CPRM
Cia. Portuguesa Rádio Marconi

CTNE
Cía. Telefónica Nacional de Espana

CYTA
Cyprus Telecommunications Administration

DBP
Deutsche Bundespost

EMBRATEL
Empresa Brasileira de Telecomunicacoes

ENTE
Empresa Nacional de Telecomunicaciones de Espana

ENTEL
Empresa Nacional de Telecomunicaciones de Argentina

ETPI
Eastern Telecommunications Philippines Inc.

EXCOFINA
International Telecommunications Co. Ltd.

F&G
Felten & Guilleaume Carlswerk AG

FC
French Telegraph Cable Company

FCR
France Cable et Radio

FTCC
FTC Communications Inc.

FUJ
Fujitsu Limited

GMCR
Globe Mackay Cables and Radio

GNTC
Great Northern Telegraph Company Ltd.

HTC
Hawiian Telephone Company

INDOSAT
Indonesian Satellite Corporation

INTELCI
Societé des Télécommunications Internationales de Cote Ivoir

IRU
Indefeasible Right of Use

ITA
International Telecommunications Administration

ITALCABLE
Servici Cablografici Radiotelegrafici e Radioelettrici S.p.A.

ITDC
International Telecommunications Development Corporation

ITTCVI
ITT Communications Inc., Virgin Islands

ITTWC
ITT World Communications Inc.

JITL
Jamaica International Telecommunications Limited

JTM
Jabatan Telekom Malaysia

KDD
Kokusai Denshin Denwa Company Limited

MPT
Ministry of Posts and Telecommunications

NAG
Netherlands Antilles Government

NASC
Nippon Asia Submarine Cable Company

NATDC
Nippon Asia Telecommunications Development Corporation

NEC
NEC Corporation

NL
International Telecommunications, The Netherlands

NSW
Norddeutsche Seekabelwerke AG

NTTPC
Nippon Telegraph and Telephone Public Corporation

NZPO
New Zealand Post Office

OCC
Ocean Cable Company Limited

OTC(A)
Overseas Telecommunications Commission (Australia)

OTE
Hellenic Telecommunications Organization

PERUMTEL
Perum Telekomunikasi Indonesia

PGC
Philippine Global Communications Inc.

PHILCOM
Philippine Overseas Telecommunications Company

PLDT
Philippine Long Distance Telephone Co.

PTT
Administration of Posts and Telegraphs

PW
Press Wireless

RCAGC
RCA Global Communications Inc.

SACC
South Atlantic Cable Company Pty. Ltd.

SCL
Submarine Cables Limitsd

SDTL
Societé de Developement des Télécommunications du Liban

SEACOM
Southeast Asia Communications Group

SERT
Service d'Etudes et des Recherches et des Techniques des P. T. T.

SODETEL
Societé de Developpement des Télécommunications du Liban

STC
Standard Telephones and Cables PLC

STICI
Societé des Télécommunications International de Cote Ivoir

SUBMARCOM
Les Cables de Lyon and Cie. Industrielle de Télécommunications CIT-ALCATEL

TAS
The Telecommunications Authority of Singapore

TELECOMS
The Telecommunications Authority of Singapore

TELESENEGAL
Societé des Télécommunications International du Senegal

TELEVERKET
Central Administration of Swedish Telecommunications

TGC
Teleglobe Canada

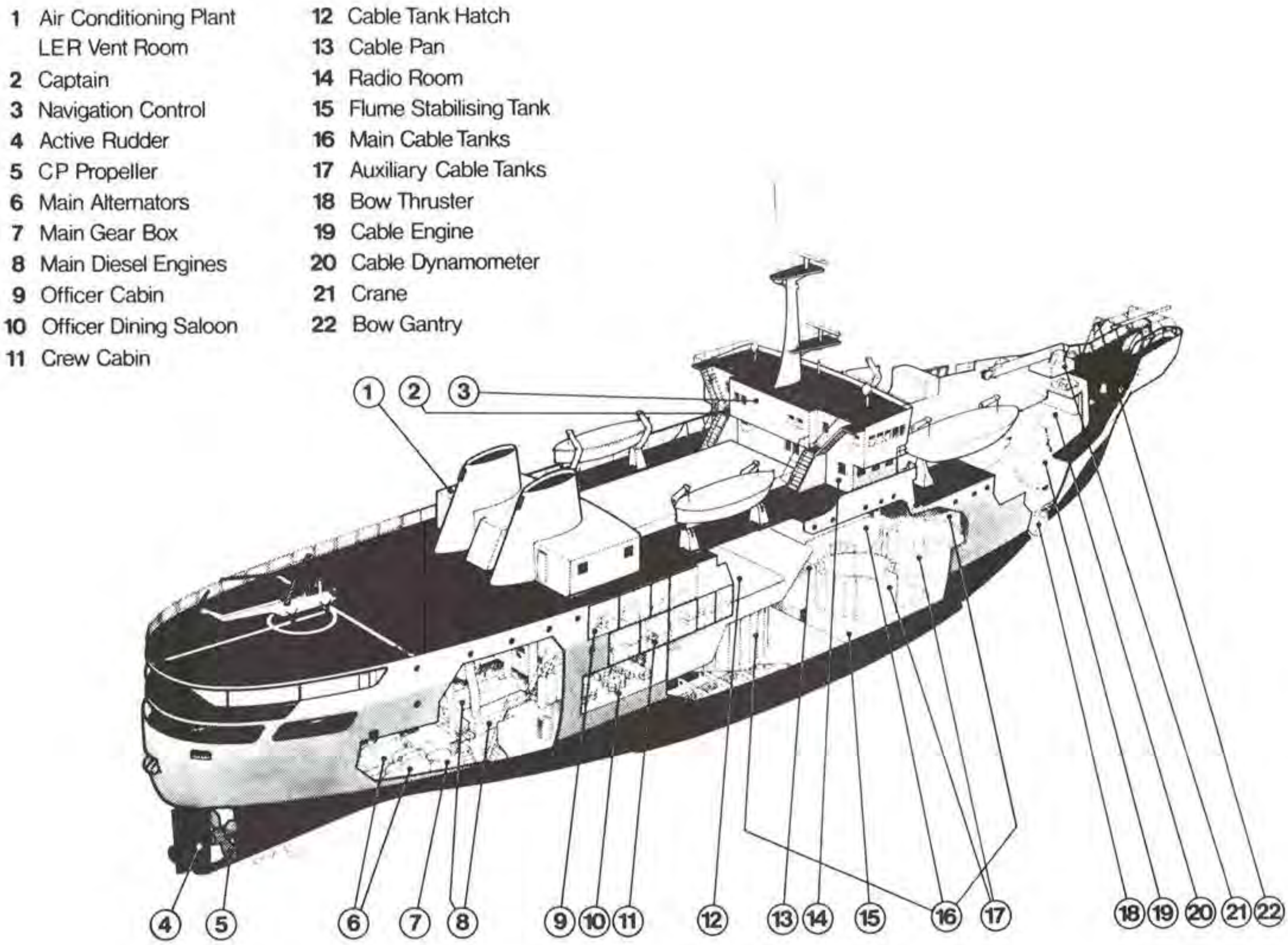
TRL
Telecommunications Research Laboratories, Denmark

TRTT
TRT Telecommunications Inc.

USUCC
United States Underseas Cable Corporation

WECO
Western Electric Company

WUI
Western Union International



MONARCH (5) and IRIS (3) came into service in 1975 for the then-designated British Post Office, now British Telecom, principally for cable service restoration in the British home waters, and in the North Sea and the North Atlantic. Highly innovative in many respects, they have removable cable tanks enabling the depot storage of a wide variety of cable styles individually, allowing quick loading of any particular cable type to speed response to a cable interruption. This cut-away drawing shows many features common to nearly all cableships, plus the innovative feature mentioned.

GLOSSARY

The definitions given are related specifically to the submarine cable industry and may not cover the full range of the general sense or usage of the terms. Underlined words are those found elsewhere in the glossary.

Regarding the most important development in submarine telephone cable technology in decades, the advent of the fiber-optic mode for undersea applications, a new lexicon is in process of formation with consequent instability and inconsistency in usage. This has prompted us to attempt a brief supplementary glossary specifically for fiber-optic-related terms instead of interlacing the new terms with the existing glossary. The parts of the glossary relating to physical cable-laying activities are applicable equally to conventional cable and fiber-optic cables. Terms relating to telephonic transmission and electronic technology are generally those of the analog mode.

A

active rudder. Term for a ship's rudder with a powerful motor-driven propeller mounted to give thrust in the direction of the plane of the rudder blade; aids the ship to meneuver more precisely, particularly at slow speed and in close quarters.

armor. Steel in the form of wires or tapes applied to the outside of cables.

armor, double. The application of two layers of armor wire.

armor, single. the application of a single layer of armor wire.

armor, tape. Steel tape applied for protection of cable intended for direct burial on land; tape armor.

armor wire. Zinc-coated mild or high-tensile steel wire of various gauges for the protection of -- and to provide tensile strength for -- seacables.

armored cable. Cable with an outside layer or layers of armor wires or tapes to provide tensile strength during the laying operation, and protection while resting on the sea bottom.

armorless cable. Cable having a stranded steel tensile strength member located inside the center conductor, and which has no outer armor.

articulated. Term used partially to describe some early designs of repeaters made up of a jointed string of water-tight containers, intended to behave mechanically somewhat like the cable into which they were inserted.

attenuation. A measure of the loss in electrical strength encountered by the signals sent through a cable, usually expressed as a function of frequency.

B

beach anchor. The hold-fast at the shore-line for a submarine cable, usually consisting of an earth-embedded strong cross member to which the armor of the shore-end cable is connected inside the beach pit.

beach pit. The excavation made to accommodate the joining of the sea and land portions of a cable system; sometimes finished as a concrete vault at the landing point, to accommodate the beach anchor and the beach splice.

beach splice. The junction of the land cable and shore-end cable above the water's edge at the cable landing point.

bell mouth. Name given to a device mounted above a cable tank with an opening in the form of a hyperboloid of revolution, through which cable is led from the tank to the deck.

bending radius. Term used to describe the limitation of allowable curvature of the cable.

bidirectional. Term used to describe the transmission of electrical signals in both directions simultaneously by a single facility.

bow sheaves. Large free-running wheels with grooved or flat circumferences, with one, two, or more wheels side by side, mounted on a 'thwartship axis at the bow of cable ships, over which cable is led aboard (or overboard) to or from the cable engine and the ship's cable tanks.

bow thruster. A powerful motor-driven propeller mounted in a tunnel across the bow of the ship below the water line to swing the bow to port or starboard without any headway on the ship; also aids in maneuvering at very low speeds or astern.

broad-band transmission. The transmission of a range of frequencies much wider than a voice channel, encompassing all of the voice channels in a multi-channel transmission system.

buoy. A floating device of nearly spherical shape, overboarded with an anchor and line, to mark a certain geographical position (marker buoy) or the position of a cable end;

in the latter case the buoy is physically connected (rope, chain) to the cable.

burial, direct. The instalation of land cable or shore-end cable directly into the ground without conduits.

C

CCITT. Comite Consultative International de Telephonie et Telegraphie.

cable. As related to submarine cable systems, the physical facility used for transmission of electrical signals between termini, consisting of conductors and insulants, usually in coaxial form, with provisions for tensile strength to permit laying in the sea, and exterior protection as required by ambient conditions.

cable, armored. Cable with steel wires on the outside; see armored cable.

cable, armorless. Cable without steel wires on the outside; see armorless cable.

cable attenuation. The measure of the loss in electrical strength encountered by signals sent through the cable, usually expressed as a function of frequency and measured between reactance-free resistors representing the resistive component of the cable impedance at high frequencies.

cable core. The part of the cable consisting of the center conductor and the dielectric.

cable drum. Motor-driven and power-braked large cylinder with a smooth circumference and means for fleeting; used to pick-up and pay-out cable; achieves friction between the cable and the drum surface by several turns of cable held back or drawn off.

cable engine. Industry term for the main element of the cable machinery, the powered drum or other device which performs the pick-up and controls the pay-out of cable. See also linear engine.

cable fault location. The process of electrical testing at a terminal station to find the location (and sometimes the cause) of a malfunction.

cable floats. Inflatable pillow-shaped plastic bags or empty metal drums which during the installation of the shore-end cable enable the cable to be kept afloat near the water's surface so that it can be pulled from the ship towards the beach. Floats are connected to the cable at regular intervals; once the cable has reached its correct position, the pennants are cut and the cable sinks to its intended resting place.

cable joint. The connection between two pieces of core. Joints are made in the factory to make up repeater section lengths, and on board ship when cable sections have to be joined either during installation or repair. See also cable splice.

cable, land. The portion reaching from the water's edge to the terminal station.

cable layer. Industry term for a ship designed for cable laying; usually with cable storage tanks having capacity for hundreds of miles of cable; also usually capable of making cable repairs.

cable machinery. Term for the mechanical devices on board a cable ship for picking up and paying out cable, repeaters, and equalizers; for repair operations drum-type machines are mostly used; for laying operations generally linear engines of the caterpillar or multi-wheel type are utilized.

cable, main. The major portion of a total cable system represented by the part usually laid in the deeper reaches of the route, to distinguish it from the cable configurations used to come ashore, and those that are laid across land.

cable mile. By industry, taken as 1,855.3 meters, or 6,087 feet. See also mile, nautical.

cable pan. 1. A large container for holding up to twenty miles of armorless cable. For technical reasons, armorless cable is not stored in factory storage tanks; instead, each repeater section is stored in individual pans which can be submerged in a floodable test tank for making electrical measurements under controlled temperature conditions. Pans are transportable within the plant grounds and may be moved one by one near to the cable ship for loading.

2. Part of a recently-achieved cable repair system, the cable repair ship being designed to have pans loaded or unloaded into or from the ship, many pans being kept charged with various configurations of cable in a depot. When called for repair, the appropriate pans are put aboard promptly, saving in some instances many hours of reaction time over conventional procedures.

cable pilot. The designation for the transmission of a supervisory pilot frequency which is inserted as close to the seacable termination as practicable and extracted likewise at the opposite terminal. See also pilot, system.

cable plow. A device which is towed over the ocean bottom making an opening into which the seacable is placed and buried; used to protect cable against commercial fishing equipment and ship's anchors.

cable, repair. Cable of lesser attenuation than the main cable, which is used in deep water repairs to permit lengthening of a repeater section without upsetting the repeater gain/cable loss relationship.

cable, shore-end. Seacable with heavy armor (single armor or double armor depending on the water depth and other conditions) for mechanical protection in shallow water, and containing shielding to reduce electromagnetic interference.

cable splice. The connection between two pieces of cable including the armor wires (as distinct from a cable joint which connects only the core); the armor wires of armored cable are normally connected by an overlay splice where the tensile strength is transferred by friction between the armor wires of the opposite cable ends.

cable, station. The piece of cable sometimes installed from the end of the land cable to the cable terminal equipment, inside the terminal station.

cable tank. Name given to the cylindrically-configured holds of cable ships; also to cable storage facilities in factories and depots.

cable terminal equipment. The apparatus installed in the terminal stations at the ends of an undersea cable system.

cable transition. The junction between cable ends of different designs, e.g. from single armor to double armor or from shielded to unshielded cable.

cable transporter. A large movable device with a motor-driven V-grooved cable sheave and a jockey wheel to keep the cable in the groove, or a small linear engine, used to transfer cable from one tank to another or to haul cable toward and into the ship during the cable loading operation.

cable vault. An enclosure usually located in the basement of the terminal station where the land cable enters the building and where some excess land cable may be coiled up; sometimes there is a transition between land cable and station cable in the vault.

cableship. A ship specially equipped for cable laying or cable repair; basic equipment comprises cable engines, hold-back gear, dynanometer, cable tanks, bow sheaves, and fault-location and test equipment.

carrier. A shortening of the term carrier frequency, to describe an electrical signal used to accomplish the translation of frequency bands.

carrier, commercial telecommunications. The term applied to an organization whose function is to render telecommunications service.

carrier, record. The term used in the United States to distinguish the organizations dealing with the transmission of the printed or written word only from those engaged in the telephone business.

carrier telegraphy. The transmission of telegraph signals by means of discrete frequencies allowing the utilization of a wider frequency band (e.g. voice grade channel) for many simultaneous telegraph transmissions; see also multiplex.

caterpillar gear. Industry term to describe the machinery installed on cable layers consisting of devices with two or more endless treads which run together tangentially to grip cable being paid out or hauled in.

center conductor. The inner conductor of the coaxial structure of seacables; comes in three configurations: solid copper wire (for armored cables), solid copper wire plus surrounding copper tapes (now obsolete), and a copper tube over a stranded steel member in armorless cable.

channel. The electrical means for one-way transmission.

chute, stern. The name given to a structure or device located at the stern of a cable layer, to provide a guide for the passage of cable and submerged devices being overboarded, having a radius of curvature consistent with the allowable bending radius of the cable.

circuit. The electrical means for a two-way transmission.

circuit, data. The electrical means for two-way transmission of binary signals.

circuit, telegraph. Circuit suitable for transmission of binary signals such as teleprinter signals, usually obtained by subdividing a voice circuit into as many as 24 or more telegraph circuits.

coaxial. Term used in industry as a noun to designate the assembly of center conductor, insulant, and outer conductor; the portion responsible for the cable's electrical characteristics.

coiling. The process of stowing cable into a cable tank, by manpower, placing the cable into flat spiral layers called flakes.

composite center conductor. Industry term to describe a center conductor composed of solid copper wire surrounded with several helically-applied copper tapes. Now obsolete.

conductor. Metallic (usally copper or aluminum) portion of the coaxial.

cone. The structure rising in the center of a cable tank, in the form of a truncated cone (conic frustum), around which the cable is coiled at the inside of a flake. The diameter of the cone at the top is commensurate with the allowable bending radius of the cable. The cone tends to stabilize the load of cable in the tank against extreme ship movement, and together with the crinoline aids in the prevention of tangles or kinks during laying.

core. The center conductor and the dielectric.

concentricity. Important mechanical characteristics of the core; a measure of the deviation of the center conductor position relative to its ideal location in the exact center of the dielectric cross-section.

conditioning. A process sometimes required to modify a channel or circuit normally used for voice communications to make it suitable for the transmission of high speed binary data.

confidence test. A test of several weeks duration to which repeaters are subjected before shipping in order to discover "early ailment" cases; during the test one or more critical characteristics of each repeater are continuously monitored; the repeater may be subjected to hydrostatic pressure at the same time.

crinoline. Ring-shaped structure which surrounds the cone and which can be vertically adjusted so that its distance from the top of the cable coil can be kept virtually constant; together with the cone it forms a relatively narrow opening around the cone through which the cable is paid out smoothly.

D

data channels; data circuit. Facility for the one- or two-way transmission of binary data.

datum line. The axis of the cable from the point it enters the linear cable engine, through the engine, and tangent to the stern sheave or chute.

deadman. Industry term for the beach anchor.

deep-sea cable. In the case of armored cable, that with a minimum amount of armor, sufficient to withstand the tensile forces during the laying operation but not intended for protection against physical damage which is generally considered to be almost nonexistent in deep water; armorless or lightweight cable.

depth profile. The graphic description of the water depth along a seacable route where the abscissa represents the distance along the route and ordinate the water depth, usually at an exaggerated scale.

depth recorder. The instrument which makes a continuous plot of water depth versus time. See also echosounder.

dielectric. The insulation between the inner conductor and the outer conductor of the coaxial structure of a coaxial seacable; consists usually of high-molecular polyethylene with high insulation resistance and low dissipation factor.

direct burial. The installation of land cable or shore-end cable directly into the ground without using conduits.

directional filter. A combination high-pass and low-pass filter with a common branching point; used to separate the higher and lower tranmission bands of a bidirectional system.

double armor. The application of two layers of armor wires to a coaxial, usually done to provide a high order of abrasion resistance, and also high breaking strength to resist parting by dragging anchors and trawls.

drag coefficient. Relates drag forces on a towed cable to towing velocity and cable diameter; mostly determined by towing tests.

draw-off gear. The hold-back gear becomes the draw-off gear when picking up. The draw-off device rotates (or moves) slightly faster than the drum, exerting a pull tending to tighten the turns around the drum.

drum, cable. Industry term to designate the principal part of a cable engine; the cylindrical power-driven and power-braked member around which the cable passes.

drum room. Industry term for the location on board ship where the instrumentation and control of the mechanical activity of cable laying is concentrated.

dunnage. Wooden slats or boards that are placed between layers (flakes)of cable as it is coiled into a cable tank.

dynamometer. Device to measure cable tension on board a cable ship during pick-up or pay-out; consists of a sheave over which the cable runs, located between the cable engine and the overboarding sheave or chute, and which is mechanically connected to a load cell or sensor of similar function, giving a continous read-out of tension; in another form, plate dynanometer, a curved plate offset upward from the cable datum line, over which the cable slides, exerting a force proportional to tension, read by a load cell.

E

earth potential. The difference in potential between the points on the earth's surface at the terminals of a cable system.

echosounder. Shipboard equipment which measures the distance between the ship's bottom and the ocean floor by sending out ultrasonic pulses via a transucer; the pulses are reflected at the sea bottom and the echoes are received with the same transducer; the elapsed time between sending the pulse and receiving the echo is a measure of the depth; a PDR (Precision Depth Recorder) is often used with the echosounder to provide an increased degree of accuracy.

engine, cable. Synonymous with the industry term cable machinery, to designate the facilities for pick-up and payout of cable from a cableship.

engine, pay-out. Industry term generally applied to the mechanism for controlling the overboarding of cable and repeaters during a normal cable-laying operation.

equalization program. Sequence of events to determine the required ocean block equalizer characteristics during the laying operation and the assembly or adjustment or selection of the equalizer networks; related to system tests during laying.

equalizer, ocean block. Assembly of networks placed in a water-tight enclosure and inserted in the cable, which reduce the level deviations accumulated over an ocean block; typically they are assembled or adjusted on board the ship during the laying operation; mechanically they are practically identical to repeaters.

equalizers, terminal station. Adjustable networks for equlization and control of transmission parameters properly controllable at the ends of the system.

equalizer assembly. Operation on board a cable-laying ship where equalizers are assembled during the laying operation after the requirement for their characterteristics have been determined by computation.

equalizer section. A repeater section containing an ocean block equalizer.

expansion matrix. A computation which reflects the nonlinear gain behavior of bidirectional repeaters with a common amplifier for both directions of transmission; permits the establishment of the margin of a system against nonlinear singing.

extrusion. The process in cable manufacturing of applying the insulant in hot plastic form to the center conductor as it passes through the extrusion machine; also the process of applying the outer jacket on armorless or light-weight cable.

F

FIT. A unit which is used to indicate the reliability of a component or device; one FIT corresponds to a failure rate of 10^{-9}/hour.

facility. A term used broadly to describe those things which are used for telecommunications service.

fairlead. A shipboard device for guiding the movement of cable from or to the tank and to or from the deck, cable engines, and sheaves, configured to restrain the bending of the cable to the allowable bending radius.

fathom. A length of six feet. One thousand fathoms approximates a cable mile or a nautical mile.

fault location. Procedure of electrical tests made from a terminal station or a cableship to determine the location (and sometimes the cause) of system malfunction.

feather edging. Industry term for boards of triangular cross-section that are placed alongside cable crossing the turns of a flake in a cable tank to avoid the undesirable concentrated compressive stresses occasioned by cables crossing at right angles under heavy weight from successive flakes above.

final splice. Cable junction between the seaward end of the previously-installed shore-end cable and the bitter end of the cable in the cable laying ship. The final splice concludes the cable laying operation.

first splice. Cable junction between the seaward end of previously-installed shore-end cable and the first end of the cable in the cable laying ship. The first splice commences the cable laying operation.

five-wheel gear. Term to describe the pay-out engine developed in England about 1950 to enable laying of rigid repeaters; five sheaves in the same vertical fore-and-aft plane with axes athwartships, around which the cable was led over-and-under, with arrangements for by-passing the repeaters around the engine on a trolley with the ship slowed to about one knot.

flake. Industry term for one spirally-laid-down layer of cable in a cable tank.

fleeting. the process of moving the turns of cable that are around a cable drum in an axial direction (sliding them over) so that cable leading onto the drum may meet the surface of the drum perpendicualrly and not pile up toward the flange.

fiber optics. Facilities for the transmission of light through glass fibers, used for digitized telecommunications.

fleeting knife. Mechanical controlling device applied to the cable drum; its purpose is to move over the cable turns on the drum by the amount of one cable diameter per revolution of the drum, thereby making sure that the incoming cable is encountering the drum perpendicularly.

flexible. Term applied to repeaters designed to behave somewhat like enlarged segments of cable, to permit their handling, storage, laying, and recovery with cable machinery not initially designed for repeatered cable systems, typified by the multicontainer articulated repeaters produced in the 1950-60 period; term also justifiably applied to those relatively short (about 3 to 1 length-diameter ratio) monocontainer repeaters to which the cable is attached by flexible couplings (gimbals, universal joints) permitting the repeater to safely pass around drums and sheaves.

floating in. The process of drawing cable from a cable ship to shore by a pulling line, the cable having floats progressively attached so that it remains near the surface until the end is made fast ashore, after which the floats are removed allowing the cable to sink to the pre-determined location on the seafloor.

floats, cable. Inflatable pillow-shaped plastic bags or empty metal drums for use in floating in. See also cable floats.

flooding, tar. The application of an asphaltic tar in hot fluid state to the cable at the point of application of the armor wires, or just afterward; also applied to jute serving.

G

gain compression. Small reduction in repeater gain under traffic load conditions; only significant in systems with a large number of repeaters in tandem.

gear, cable. Term for cable machinery.

grapnel. Device to grapple (hook) the cable from a cable repair ship in order to bring it to the surface; grapnels come in different configurations, their selection for use depending upon the nature of the bottom and other considerations.

grapnel rope. Special rope connecting the cable repair ship with the grapnel during a grappling operation.

group. The voice channels occupying a band of 48 kiloHertz, either 12 at 4 kHz spacing, or 16 at 3 kHz spacing.

gutta-percha. Organic resin with properties suitable for a cable insulant; widely used for the oceanic telegraph cables of the cable telegraph era, now obsolete.

H

half-circuit. One half interest in the total cost of a cable circuit from terminus to terminus.

hold-back gear. A sheave with jockey wheel coupled to the cable drum, turning a little slower on pay-out and a little faster on pick-up, to keep the cable tight so that it does not slip on the drum when under tension; properly called draw-off gear when picking up; comprised of caterpillar or paired-wheel machinery on some more recently-built cable ships.

hydrodynamic constant. The term related to the certain physical parameters of the cable such as weight in water, outer diameter and surface smoothness; this constant is used to determine the slope of the line that a cable forms when towed through water; the unit is degree-knots.

I

IRU. Indefeasible Right of User, an obligation on the part of the owners of a facility to furnish to the purchaser of IRU continuing access to and enjoyment of the agreed-upon circuitry.

ITU. International Telecommunications Union.

inflexible. Term describing a repeater configuration not designed to be handled (loaded, stored, laid, recovered) in the same manner as cable; rigid.

insulant. the material existing between the inner and outer conductors of a coaxial cable; dielectric.

interface, ongoing. The point of connection between the seacable system and the facilities that extend the service into the telecommunications network ashore.

interlock. Circuitry and mechanical restraints which prohibit access to the high-voltage sections of cable power feed equipment until potentials are removed and cables appropriately and safely terminated.

J

jacket. The outer coating of high-density polyethylene on an armorless or light-weight cable; also a coating of an appropriate elastomer on individual armor wires, such as polyvinyl chloride or neoprene, as an erosion inhibitor.

jet-bedding. The process of fluidization of the soil of the sea-bottom by pumped water jets, to imbed cable and repeaters into the sea floor.

jockey wheel. A wheel small in diameter compared to the sheave upon which it "rides", whose purpose is to maintain the cable firmly in the groove of the sheave.

joint, cable. The union of the center conductor and the dielectric of two sections of core.

jute bedding. One or more layers of jute yarn between the outer conductor and the armor layer so that the coaxial is not damaged during cable armoring and cable handling.

jute serving. A layer of jute yarn on top of the armor to give more corrosion protection to the armor wires, to resist any tendency of displacement of the wires during handling or laying, and to reduce slippage of cable on the cable drum.

K

knitted armor wire. The preparation of the armor wires with coverings of organic (such as cotton) or inorganic (such as nylon) fibers, for purposes related to the overall cable design.

knot. One nautical mile per hour.

L

lagging. The outer protection for cable placed on reels for shipping, consisting of boards parallel to the reel's axis fitted between the peripheries of the flanges of the reel.

land cable. The portion of the cable of a sea-cable system installed on land.

landing point. The name of the place where the cable comes ashore.

laying effect. Change of cable attenuation caused by mechanical stress during the laying operation; somewhat dependent on cable laying parameters and type of laying engine.

lead. The angle formed between the vertical plane of the cable being laid or picked up, and the lubber-line of the ship.

leak test. A test to determine whether a repeater or equalizer housing is leak proof; mostly performed under a test pressure which is well above the actual working pressure.

leased service. The arrangement whereby a user contracts for the exclusive--and generally continuous--use of a circuit or facility.

life, system design. Variously stated as the useful life of a system, meaning the period over which it is reasonable to continue maintenance, or during which no unrestorable deterioration or failure of cable or submerged electronics will occur; usually taken as twenty years or more for submarine telephone cable systems.

light-weight cable. Synonymous to armorless cable; although light in weight relative to armored cable, light-weight cable is considerably heavier than water.

linear engine. Cable laying engine wherein the cable forms a straight line while going through the engine; principle designs are the caterpillar and the multi-wheel engine.

link. An imprecise term that may mean a channel, a circuit, or a system between correspondents.

load line. Structure between the tank building of the cable factory and the pier, to support and guide the cable being loaded into the cable ship.

M

machinery, cable. The apparatus on board ship for the pick-up and pay-out of cable.

main cable. The major portion of a total cable system represented by the part usually laid in the deeper reaches of the route, to distinguish it from the cable configurations used to come ashore, and those placed from the water's edge to the terminal station.

mile, cable. By industry tradition, 1,855.3 meters, or 6,087 feet.

mile, nautical. Taken generally as 1,852 meters, or 6,076 feet.

monocontainer. Description of a repeater (or equalizer) configuration that consists of a single cylindrical chamber to which cable is attached to the ends, either flexibly or inflexibly.

multichannel. A term used to describe a transmission system in which many circuits are operating simultaneously with commonality of facilities.

multicontainer. Description of a repeater (or equalizer) configuration consisting of several "containers" coupled end-to-end flexibly, to which the cable connects at the end containers; also called articulated.

multiplex. The modifier applied to telephony or telegraphy to indicate the build-up of a wide transmission band from many narrower ones, or the simultaneous transmission of many discrete circuits with commonality of facilities.

multi-wheel gear. Description of a laying engine consisting of a number of pairs of pneumatic-tired wheels running tangent to each other and all in the same verical fore-and-aft plane, each pair pressed together so as to grip the cable as it is led between them in a straight line, equipped with drive and brake mechanisms that limit the shear forces, and arranged so that each pair may be successively parted to allow the passage of a repeater. Referred to also as paired-wheel.

mushroom anchor. An anchor with special characteristics, the head of which is a portion of a hollow iron sphere, from about latitude 50° and on up, with the stock affixed inside at the "pole". Placed in mud or sand it tends to become imbedded, and is used principally as a buoy anchor or a mooring anchor.

N

nautical mile (cable). Unit of measure for cable, by industry tradition taken as 1,855.3 meters, or 6,087 feet.

nautical mile (general). Unit for measuring oceanic distances, generally taken as 1,852 meters, or 6,076 feet.

nonlinear singing. A possible defect in long systems having a high number of repeaters with common amplifiers for both directions of transmission; nonlinear singing may occur if there is an irregularity in the system resulting in surplus gain and if the nonlinear singing margin of the repeaters is insufficient.

noise band, system. A frequency band outside the regular transmission band which is monitored continuously for the occurrence of excessive system noise.

O

ocean block. Portion of a seacable system between equalizers, typically consisting of 10 or more repeater sections and 2 equalizer half-sections.

ongoing interface. The junction between the seacable system and the facilities of inland telecommunications network on shore.

optical fibers. Small-diameter glass strands; when clad, act as light-guides from modulated (mostly digital) light sources to light detectors; increasingly useful for wide-band telecommunications purposes.

order wire circuit. One or more service telephone channels between terminal stations using frequency bands located outside the regular transmission bands.

outer conductor. Copper or aluminum tape surrounding the dielectric; generally helical copper in the case of armored cable, longitudinal copper or aluminum for armorless cable.

outer jacket. Plastic jacket on top of the outer conductor of armorless cable, consists of high-density polyethylene, with or without pigment.

overlay splice. A means of preserving the continuity of the strength and protection of the armor wires at a cable junction, by cutting the coaxials shorter than the armor, and after conclusion of the joint, restoring the wires beyond the joint over the undisturbed wires of each section of cable.

P

PDR. Precision Depth Recorder; an instrument with a higher order of accuracy, and usually much larger chart trace, than the regular ship's echosounder, which, using the echosounder's pulse transmission and echo reception, produces a depth profile of desirable accuracy and size.

paired-wheel. See multi-wheel.

pan. Containers for cable; see cable pan for details.

parachute. Device sometimes affixed to repeaters during their transit from rest aboard the cableship to deployment over the stern, opening to form a drogue in the water, intended to slow the repeater sink rate to match the cable subsidence.

paragutta. An insulant resin compounded of gutta percha and rubber, with some improved characteristics over gutta percha, used in the sea-cable telegraph industry until about 1950; now obsolete.

pay-out. The process of dispensing cable from a cable ship.

pay-out engine. On a cable-laying ship, which is usually equipped with cable engines fore and aft, the after engine, used for laying long lengths of cable over the stern.

piano wire. Synonymous to taut wire; paid out during cable laying for precise measurement of distance travelled.

pick-up. The process of inboarding cable into a cable ship from the sea bed.

pilot, cable. Supervisory frequency inserted near the termination of the seacable and extracted likewise at the other end.

pilot, system. Supervisory frequency inserted and extracted near the ongoing interface.

pit, beach. The excavation just above the water's edge to accommodate the junction of the sea and land portions of cable, and the beach anchor.

plate dynamometer. A tension-measuring device, by which the cable's straight line trajectory from engine to sheave (or chute) is slightly distorted by the cable sliding over a raised plate resting on a load cell, the output of which gives a measure of tension.

plowing. The process of imbedding the cable into the sea-bottom as the cable is being laid, by means of a sled-like device which is pulled by the cable-laying ship.

polyethylene. The thermoplastic synthetic polymer which, in a highly refined state, is used, in high molecular weight form, for cable insulant, and in high density form, for cable jacket material.

polythene. British designation for polyethylene.

potential, earth. The difference in potential between the points on the earth's surface at the terminals of a cable system.

power feed equipment. Equipment designed to energize the in-water portion of a seacable system; normally consists of a constant-current source of high reliability and double redundancy.

power separation filters. Networks designed to separate the energizing current from the transmission signals; located in repeaters, equalizers, and the power feed equipment.

pressure coefficient of attenuation. Change of attenuation of cable per increment of a pressure unit (psi, kg/cm^2); the pressure coefficient itself may be a function of pressure and frequency.

Q

quadrant. Portable mechanical guide consisting of a framework carrying many grooved rollers, which has the shape of a quarter circle; used during cable loading or cable transfer in order to guide the cable through a 90-degree change of direction.

R

RFI. Radio frequency interference.
The intrusion of unwanted signals or electromagnetic noise into the cable, for which shielding is required.

recorder, depth. That part of an echosounder which produces a continuous plot of the depth versus time.

reel, shipping. Device upon which short lengths of cable are "spooled" for transportation, and used to facilitate placement on land.

repair cable. Cable of lesser attenuation than the main cable, used in deep water repairs to permit lengthening a repeater section without upsetting the repeater gain/cable loss relationship.

repair repeater. One of a group of spares manufactured concurrently with the production of the system repeaters, whose circuitry permits its substitution for any repeater in the system.

repeater. Electronic device whose purpose it is to amplify system transmission signals. Placed at regular intervals along the cable, they are housed in mechanical containers able to withstand the tensile stress during the laying operation and the water pressure while resting on the sea bottom.

repeater, repair. Repair repeater.

repeater section. Length of cable between repeaters.

repeater supervision. The electrical monitoring of repeater performance from the terminal station.

rigid. Term applied to a configuration of monocontainer repeaters having a length-to-diameter ratio of about 10 and to which the cable is attached inflexibly at each end; requiring either a linear laying engine for deployment, or the use of five-wheel gear or other by-pass technique.

route. The actual location of the cable; also, loosely, the names of the cable landing points or the system termini.

rudder, active. One containing a motor-driven propeller with its shaft in the plane of the rudder blade, used as a maneuvering aid.

S

SB. A system type designation, SB representing the design of the first transatlantic telephone cable system, and SD, SF, and SG representing later generations of development.

sea-earth cable. Cable connecting the earth terminal of the power feed equipment with the sea-earth electrode.

sea-earth electrode. Electrode or set of electrodes connected to the end of the seaearth cable, intended to afford the seacable system freedom from station earth potential disturbances; generally essential in direct current cable telegraphy.

service channel. Means of communication between cable terminal stations using frequency bands outside the regular transmission bands; same as order wire.

shaving. Process in cable manufacture of sizing the extruded dielectric precisely within tolerances as specified, and the required degree of concentricity with respect to the center conductor, before application of the outer conductor.

sheaves. The wheels at the bow of all cable ships and at the stern of some, over which the cable passes when entering or leaving the ship in laying or recovery operations; also variously-sized V-grooved wheels in other devices, such as cable transporters.

sheaves, bow. The two or more free-turning wheels, generally of diameter above six feet, mounted on a 'thwartship axis at the bow.

sheave, stern. The wheel at the stern of a cable-laying ship (as distinct from a cable repair ship which usually has no stern sheave).

shielding. The provision of materials (iron or copper tapes, lead extrusions) on the outside of the coaxial under the armor to reduce electromagnetic interference.

shore-end cable. Seacable with heavy armor (single armor or double armor depending on the water depth and other conditions) for mechanical protection in shallow water, and containing shielding to reduce electromagnetic interference.

single armor. One layer of steel wires.

slack. The difference between the length of cable paid out and the geographic distance along the bottom contour.

solid-state. Description of a repeater which contains no thermionic devices; transistorized.

splice, beach. The junction between the sea portion and the land portion of a cable system.

splice, final. The junction between the seaward end of the previously-laid shore-end cable and the bitter end of the main cable.

splice, first. Cable junction between the seaward end of a previously-installed shore-end cable and the first end of the cable in the cable-laying ship; the first splice commences the cable-laying operation.

splice, overlay. A procedure by which the strength of the armor wires is maintained at the junction between two sections of armored cable.

station cable. The portion of cable between the cable vault and the terminal equipment.

station, terminal. The physical plant comprising shelter, utilities, and the cable system terminal equipment.

stern chute. In laying cable over the stern, the last mechanical element cable and repeaters pass before they go into the water is the stern chute (or stern sheave); a guide element whose radius of curvature should exceed the bending radius of the cable.

stern sheave. The wheel at the stern of a cable laying ship over which the cable and repeaters are deployed into the sea.

stop band. The frequency band between the two transmission bands of a bidirectional system.

stopper. The means by which a cable can be made fast without cutting or bending; by one means, a piece of grapnel rope is attached to the cable using the overlay splicing technique; the bight of the rope is terminated in a thimble which can easily be connected to more rope or chain, anchors, etc.; other devices such as self-tightening grips and pre-formed wire stoppers are also used.

storage tank. Large cylindrical tanks are located in the cable factory or depot for the storage of several types of seacable; depending on the diameter of the cable these tanks can hold hundreds of miles of cable; some tanks may be flooded and have facilities for water circulation for temperature stabilization preparatory to electrical measurements.

supergroup. Five groups, the voice channels occupying a banwidth of 240 kiloHertz, 60 at 4 kHz spacing or 80 at 3 kHz spacing.

supervisory equipment. Equipment located at the terminal station for the purpose of monitoring repeater performance.

surround tapes. The copper tapes which were helically applied to a central copper wire, to form a composite center conductor consisting of the central wire and three tapes; an obsolete configuration.

system. A term used to designate the collection of apparatus, facilities, wires, cables, or whatever, to comprise a two-directional broadband pathway for telecommunications transmissions.

system design. The proper relationship of all system parameters such as basic noise, intermodulation noise, circuit capacity, overload margin, cable characteristics, sea-bottom profile and temperatures, repeater characteristics, equalization margins, etc.

system design life. Variously stated as the useful life of a system, the period during which it is intended to be economically satisfactory to continue the system in service, or the period over which there will be no significant deterioration of the cable or the submerged electronics; usually taken as 20 years or more.

system noise band. A frequency band outside the regular transmission band which is monitored continuously for detection of the occurrence of excessive system noise.

system pilot. A supervisory pilot frequency which is inserted near the ongoing interface of one terminal station and extracted near the ongoing interface of the other terminal stations.

system tests during laying. Upon completion of the first splice, the first ocean block of the system is energized and transmission tests are continuously made from which required equalizer characteristics are computed; repeated for successive ocean blocks.

T

TASI. Acronym for time assignment speech interpolation equipment, enabling the effective expansion of the number of useful voice circuits in a system.

TAT. Acronym formed from transatlantic telephone, referring to submarine cables, TAT 1 being the first, in 1956.

tank, cable. The cable stowage spaces aboard a cable ship, cylindrical in from with a center cone; also at cable factories and depots, similarly for cable storage.

tape armor. Steel tapes helically applied to cable for physical protection from damage from the back-filling of land cable trenches in direct-burial installations.

tar flooding. The application of asphaltic tar in a hot fluid condition to armored cable at or near the point of armoring.

taut wire. A small-guage high-tensile steel wire which is overboarded with an anchor and paid out with controlled tension over the stern of the cable ship during the laying operation; the length of the wire is continuously measured and thus provides the exact distance between the ship and the fixed geographical starting point. This information is used to determine slack, and as a corroborative aid to navigation; called also piano wire.

temperature coefficient of attenuation. Change of attenuation per degree centigrade temperature change; the temperature coefficient itself may be a function of temperature and frequency.

temperature profile. Graphic representation of the sea bottom temperatures along the route; for the shallow-water portion the seasonal fluctuations of the temperatures are also shown.

terminal equipment. Equipment located at the terminal station and consisting of:

- Power feed equipment
- Wide-band transmission equipment
- Repeater supervision equipment
- Fault location equipment
- Pilot monitoring equipment
- Interface equipment
- Multiplex equipment (if required)
- Order wire
- Carrier supply

terminal station. The physical plant (buildings, utilities) near the landing point of the sea-cable system, containing the terminal equipment.

terminus. The name of the place at which the terminal station is located.

test, system, during laying. Upon completion of the first splice, the first ocean block of the system is energized and transmission tests are continuously conducted from which equalizer characteristics are computed; repeated for successive ocean blocks.

thruster, bow. The motor-driven propeller in the 'thwartship tunnel near the bow.

transistorized. Equipped with solid-state devices in lieu of thermionic vacuum tubes, to distinguish the current generation of repeaters and terminal equipment from earlier systems which were dependent upon long-life tubes.

trough. A guide structure for the transit of cable and repeaters along the deck; in the cable factory, the facility for cooling the extruded core to ambient temperature.

U

unidirectional. Term describing repeaters configured for transmission in one direction only, requiring twin facilities for complete come-and-go service; characteristic of the first transatlantic telephone cable system.

V

voice circuit. A means for the intelligible interchange of human speech in the approximate range of a few hundred to a few thousand Hertz, with bandwidths of about 3 or about 4 kiloHertz.

voice grade circuit. A circuit suitable for use as a voice circuit; sometimes used for purposes other than the interchange of speech.

W

wheel, jockey. Small wheel riding in the groove of a larger wheel, to help keep cable securely running in the groove.

whiting. A chalk and water slurry applied to cable that has been previously tar-flooded, to discourage sticking of adjacent turns or adjacent flakes in the ship's cable tanks during laying.

wire, armor. Galvanized mild steel wires for application in one or two layers for installations relatively shallow; galvanized high tensile steel wires for application in a single layer for relatively deep water.

wide band. Synonymous with broad band; also modifier for facility indicating capability of broad band transmission.

X

X-ray procedure. The universal industry requirement that every joint made in the factory or aboard ship shall be X-rayed with 3 shots rotated 120° and the results examined for voids or contaminants in the insulant before the outer conductor is applied.

SUPPLEMENT TO GLOSSARY

SOME FIBER-OPTIC TERMS

It is not presently within the scope of this compendium to provide a comprehensive technical glossary of fiber-optic submarine telephone cable terminology--indeed it will be obvious that this small supplement falls far short of adequacy.

The few terms shown here were chosen to aid the non-technical reader in approaching the strange new world of fiber-optic--or lightwave--or lightguide--telecommunications.

ADPCM

Adaptive Differential Pulse Code Modulation. Process by which analog signals are converted to digital form.

analog

From the term "analogous" to denote the relationship of the converted electrical signal to the un-converted source, as, for example the intensity of sound pressure relating to the value of electrical potential, or the frequency of the sound source to the frequency of the electrical signal.

bit

Binary digit. In digital transmission, the elemental unit of information, corresponding to a two-condition, i. e., binary, situation: zero or one, or "on" or "off".

bit rate

The measure of how many bits per unit of time are accommodated by the transmission system; in fiber-optic technology, usually expressed in Megabits per second (millions of bits per second)

cabling

In the construction of fiber-optic cables, the fibers are formed around the axis of the cable structure in a helical mode and the optical behavior of the fibers relates to the process of formation; thus there are "cabling losses" for instance.

cladding

The fibers are encased in protective sheaths of appropriate plastic material with specific refractive indexes, the sheath material being called "cladding".

conversion, A-D and D-A

The transformation of an intelligence-carrying signal from analog to digital form, or vice-versa.

digital

In binary form, as for an intelligence-carrying signal consisting of a stream of bits, the occurrence and distribution of the zeros and ones determining the value of the analog.

fiber

In lightwave technology, a silica-based glass monofilament drawn to a diameter of about 125μm.

housing, pressure

1. The enclosure in the cable structure that is impervious to pressure; the metal tube that contains the fibers;
2. The enclosure that contains the electronic submerged equipment in a cable system.

jointing, fusion

The procedure for joining fibers so as to create a continuous fiber obviously necessary in cable fabrication, and for joining fibers in performing a repair of a severed cable.

laser diodes

Diodes that produce coherent light in response to electrical stimulus, that are coupled to fibers physically and inject light pulses that flow through the fiber to a receiver at the far end.

lightguide

Term formerly in general use to describe transmission of intelligence by means of light through conduits, initially hollow tubes but not exclusively so defined; lightwave.

lightwave

Term denoting transmission of intelligence by means of light pulses in a conduit or via an optical fiber, formerly in general use; now mostly succeeded by the term "fiber optic".

photodetectors

Semiconductors whose electrical characteristics alter with the presence of illumination, thereby converting light pulses into electrical pulses.

regenerator

Electronic device which, upon receiving a bit that may be degraded in pulse form or position, will recognize the bit and in response, send forward a re-constructed bit with renewed shape and position; term also applied to the entire submerged device which receives degraded light pulses, converts to electrical pulses, recognizes the character of the bit, produces a re-constructed bit, converts this to a light pulse which is then transmitted forward. In some literature the regenerator is called an optical repeater.

wavelength

A characteristic of any monochromatic light flux, relating inversely to the frequency of the light and to the speed of light in vacuum. Current developments in fiber-optic telecommunications technology have singled out as optimun light of 1.3 micro-meters wavelength.

BIBLIOGRAPHY

Halsey, R. J. and Duerdoth, W. T., "The First Submerged Repeater", The Post Office Electrical Engineers' Journal, Vol. 37, Part 2, July 1944

Lawton, C. S. and Hutchins, L. H., Jr., "A Non-Armored Submarine Telegraph Cable", Proc. AIEE, Paper 53-163, January 1953

Horn, H., "Mechanical Problems of Deep-Sea Cables", Fernmeldetechnische Zeitschrift, January 1955.

Brockbank, R. A. and Myers, A. L., "A New Deep-Sea Coaxial Cable", Journal of the Institute of Electrical Engineers, Vol. 2 (New Series) 1956

Staff members, Bell Telephone Laboratories, and others, "Transatlantic submarine telephone cable system", The Bell System Technical Journal, Vol. 36, No. 1, January 1957, pp. 1-326. (Monograph 2710, Bell Telephone System Technical Publications)

Elmendorf, C. H., and Heezen, B. C., "Oceanographic Information for Engineering Submarine Cable Systems", The Bell System Technical Journal, Vol. 36, No. 5, September 1957

Zajac, E. E., "Dynamics and Kinematics of the Laying and Recovery of Submarine Cable", The Bell System Technical Journal, Vol. 36, No. 5, September 1957

Clarke, A. C., Voice Across the Sea, Harper & Brothers, New York 1958

Lawton, C. S., "More About Non-Armored Submarine Cable", Western Union Technical Review, April 1959

Bullington, K. and Fraser, J., "Engineering Aspects of TASI", The Bell System Technical Journal, Vol. 38, March 1959

Brockbank, R. A., "The Lightweight Submarine Telephone Cable", British Communications and Electronics, April 1961

Salvador, R., "Le Câble Sous-Marin Téléphonique Perpignan-Oran", l'Echo des Recherches, 8th Series, Vol. 3, No. 35, November 1962

Halsey, R. J., "Transatlantic Cables for Television", British Communications and Electronics, August 1963

Staff members, Bell Telephone Laboratories, and others, "SD Submarine Cable System", The Bell System Technical Journal, Vol. 43, No. 4, Part 1, July 1964

Holmblad, N. E., "The SCOTICE/ICECAN Submarine Cables", Ingeniørens Ugeblad, May 1964; translation by B. E. Jorgensen available from Underseas Cable Engineers, Inc.

Mottram, E. T., "Submarine Telephone Cables", IEEE Spectrum, May 1965

Munitz, A. J., "Analyzing Failures of Ocean Communications Cables", Undersea Technology, May 1966

Brockbank, R. A. and Scowen, F., "A 12 Mc/s Submerged-Repeater System", The Post Office Electrical Engineers' Journal, Vol. 59, November 1966

Lipinski, A. J., "On the Mix of Satellites and Cables in the Global Network", IEEE Transactions on Communications Technology, Vol. COM-15, No. 2, April 1967

Smith, E. P. and Chambers, G. R., "Requirements for U.S. International Telecommunications through 1975", ibid

Dawidziuk, B. M., "The Expanding Role of Submarine Cable Systems in International Communications", First International Telecommunications Symposium, Lisbon, April 1967

Redding, W., Jr., "Comsat Sees Blow to Its Services in 5th Atlantic Cable", The Evening Star, Washington, D. C., Sept. 11, 1967

Redding, W., Jr., "AT&T Plea for Cable Opens Satellite Clash", The Evening Star, Washington, D. C., Oct. 30, 1967

Waldick, L., "The Laying Effect of Sea Cable", IEEE Annual International Conference on Communications, Minneapolis, 1967; Underseas Cable World, Vol. 1, No. 7, October-November 1967

Waldick, L., "The Equalizers", Underseas Cable World, Vol. 1, No. 10, April-May 1968

Mackay, A. D. and others,"Economic, Operational, and Technical Aspects of Modern Global Communications Systems", Electrical Communication, Vol. 43, No. 1, 1968

Duncan, C. C., "Plowing Cables Under the Sea", IEEE Transactions on Communications Technology, Vol. Com-17, No. 1, February 1969

Schenck, H. H., "Telecommunications in Hydrospace: Past, Present, and Future", American Institute of Aeronautics and Astronautics -- Industry Enters Into the Sea Conference, Seattle, May 1969

Sekigawa, M., "Submarine Cable Repeater for 900 CH System", Fujitsu Scientific and Technical Journal, Vol. 6, No. 1, 1970

Staff members, Bell Telephone Laboratories, and others, "SF Submarine Cable System", The Bell System Technical Journal, Vol. 49, No. 5, May-June 1970

Ashley, G. E. and Roff, J. H., Jr., "Comments of American Telephone & Telegraph Company", Docket No. 18875, The Federal Communications Commission, August 19, 1970

Dawidzuik, B. M. and Preston, H. F., "Comparative Evaluation of Modern Transmission Media for Global Communications" Telecommunications Journal, Vol. 38, March 1971

Suzuki, K., "New Submarine Cable Burier with Guiding Equipment", Japan Telecommunications Review, April 1972

Sekigawa, M. and others, "CS-36M Submarine Coaxial Cable System", Fujitsu Scientific and Technical Journal, Vol. 9, No. 4, 1973

Tabata, H. and Ide, N., "A New 2700-Channel Submarine Coaxial Cable System", Japan Telecommunications Review, April 1974

Staff members, Standard Telephones & Cables Ltd., "New Generation (NG. 1) 45 MHz Submarine Cable System", Telecommunications Journal, Vol. 41, October 1974

Schenck, H. H., The World's Submarine Telephone Cable Systems, U. S. Department of Commerce, Office of Telecommunications Contractor Report 75-2, Government Printing Office, 1975

Valent, P., "Installation and Protection of Electrical Cables in the Surf Zone on Rock Seafloors", IEEE and MTS Ocean 75, San Diego, September 1975

Easton, R. L., "Undersea Cable Systems-A Survey", Digest of News and Events, IEEE Communications Society, Vol. 13, No. 5, September 1975

American Telephone & Telegraph Company, Long Lines Department, information release, March 24, 1976

Richardson, J. "Cable Laying By Satellite Navigation" The Post Office Electrical Engineers' Journal Vol. 67 Part 3 October 1974

Bates. O. R. "Planning and Laying the CANTAT 2 Cable" ibid

Emery, T. M. "A New Concept in Submarine Cable Depots" ibid Vol. 68 October 1975

Schenck, H. H. "The Engineering, Manufacture, and Installation of Submarine Telephone Cable Systems" MTS-IEEE Oceans 76 conference, Washington, D. C. September 1976

Baskett, R. E. J. and S. G. Foord "Fiber Optic Cables" Electrical Communications Vol. 52 No. 1 1977

Dean, N. S. and R. J. Slaughter "Development of Robust Optical Fibers" Wire Technology March 4, 1977

Staff, Cía Telefónica Nacional de España 'The Prospect for Spanish International Communications from 1976 to 1985" Telecommunications Journal September 1977

Itano, M. "Burying Work for the Japan-China Submarine Cable" ibid December 1977

Wilson, G. C. "Soviets Place Antennas in Cuba to Intercept U. S. Messages" The Washington Post December 23, 1977

Kao, K. C. and M. E. Collier "Fiber Optic Systems" Telecommunications April 1977

Bennett, A. J. et al "NG-1 Submarine Cable System" Electrical Communications Vol. 53 No. 2 1978

Yeh, L. P. "Fiber Optic Communications Systems" Telecommunications September 1978

Staff, Bell Laboratories "SG Undersea Cable System" Vol. 57 No. 7 Part 1 (whole issue) Bell System Technical Journal Sept. 1978

Gleason, R. F. and R. A. Smith "Undersea Fiber Cable" Laser Forces December 1979

Staff, IEEE Spectrum "Optical Systems, a Review" October 1979

Kirkland, F. E. and K. M. McDonald "Overseas Communications by Submarine Cables" Telecommunications May 1979

Gleason, R. F. et al "Design and manufacture of an Experimental Lightguide Cable for Underseas Transmission Systems" International Wire and Cable Symposium, Nov. 1978

Dawidziuk, B. M. "Recent Developments in the Global Submarine Systems Network" Intelcom '79 March 1979

Preston, H. F. "International Communications Network Developments and Economics" Third World Telecommunications Forum, Geneva Sept. 1979

Smith, R. A. et al "Undersea Optic Fiber Cable - Design of a Physical Testing Program" Oceans '79 October 1979

Schenck, H. H. "1980 World's Submarine Telephone Cable Systems" (book) U. S. Department of Commerce NTIA Contractor Report 80-6 1980

Dawidziuk, B. M. "Submarine systems Technology and its Application in the Pacific Area" PTC-80, Honolulu, January 1980

"The Role of Submarine Systems in the Global Communications Network" IEE, London, February 1980

Morse, G. E. "The Development of a Trawler-Resistant Submarine Cable" The International Conference on Submarine Systems, IEE, London, February 1980

George, R. A. "The Maintenance of the Submersible Plant Used on Submarine Telecommunications Systems" ibid

Jones, S. R. "Protection and Installation of Submarine Cable in Hazardous Deep Water Areas" ibid

King, D. E. N. "Reliability Engineering for Submarine Cable Systems - a Simple Approach" ibid

Belton, R. G. E. "Operational Considerations in the Provision of Cable and Satellite Systems" ibid

Bennett, A. J and J. E. Gayler "Submarine Systems: Current Technology" ibid

Bonds, M. R. et al "Route Engineering and Installation of Submersible Plant for Submarine telecommunications Systems" ibid

Dawidziuk, B. M. and H. F. Preston "International Communications: Network Development and Economics" Electrical Communications Vol 55 No 2, 1980

Staff Article "Installation of World's First Deep-Water Optical-Fiber-Cored Undersea Telephone Cable" Telecommunications Journal May 1980

Dawidziuk, B. M. and F. H. Preston "Submarine Systems and World Telecommunications" Electronics and Power July 1980

Cannell, G. J. et al "Evaluation of Single-Mode Fibres for a Submerged Cable Laid in Loch Fyne, Scotland. Sixth European Conference on Optical Communication, U. of York, U. K., September 1980

Runge, P. K. "A High-Capacity Optical Fiber Undersea Communication System" Sixth European Conference on Optical Communication" September 1980

Kojima, N. et al "Sea Trial of Submarine Optical Fiber Cable" ibid

Kameda, O. "Submarine Cable Network in South Esast Asia/Western Pacific Areas ...... in Next Two Decades" Intelcom '80 November 1980

Bonaventura, G. et al "Experience and Prospects of Submarine Cable Systems in Italy" ibid

Mialet, L. and M. Roujansky "French PTT Views" ibid

Schenck, H. H. "Cableship Characteristics" (book) U. S. Naval Sea Systems Command, PMS 383, 1981

Staff Article "Fibers Subsea: A 1st Shot in Off-Shore Undersea Fibers" Optical Spectra, May 1981

Tilly, F. J. "Submarine Syatems Technology, Current and Future" Indian Ocean Submarine Systems Symposium, Seychelles, Oct. 1981

Dawidziuk, B. M. "Prospects for Submarine Cable Communications in the Indian Ocean Region" ibid

Bird, S. G. "Planning for the Installation and Maintenance of Submarine Cables" ibid

Gayler, J. E. andJ. F. Tilly "Optical Fiber Technology-Undersea Communications Systems" Electrical Communication, Vol 56, No 4, 1981

Grant, S. and K. Custance "Fiber Optic Techniques Work Well" Telecommunications December 1981

Dawidziuk, B. M. "Undersea Systems Technology Trends" Pacific Telecommunications Council (PTC 82), Honolulu, January 1982

Mokhoff, N. "Fiber Optics - Future Submarine Cables Tested" IEEE Spectrum January 1982

Yamashita, I. et al "The Application of Optical Fibers in Submarine Cable Systems" Telecommunications Journal February 1982

Chown, M. and R. L. Williamson "Development of Optical Submarine Cable Systems in the U. K." International Conference on Communications, Philadelphia, June 1982

Staff Article "Bell Labs Tests Glass Fiber Undersea Cable for Data" Sea Technology, June 1982

Brownlow, D. L. et al "High Strength Multikilometer Lightguides for Undersea Applications" Eighth European Optical Communications Conference, September 1982

Pearson, A. D. et al "Bandwidth Optimized. . . . by Means of a Parametric Study" ibid

Schenck, H. H. " The first U. S. -Built Cableship in Thirty-Eight Years" Sea Technology, Oct. 1982

Duke, D. A. "The Fiber Optic Revolution Spreads" Telecommunications, December 1982

Williamson, R. L. "Optical Fiber Comminications Thus Far" Interdisciplinary Science Reviews, Vol 8, No 1, 1983

Staff Article "Ring Out the Old, Try Out the New" Photonics Spectra, January 1983

Rutkowski, A. M. "The Impact of New Technology on Satellite Radiocommunication" Telecommunications, February 1983

Williamson, R. L. and M. Chown "The NL 1 Submarine System" IEEE JSAC Vol 1, No 3 April 1983

Runge, P. K. and P. R. Trischitta " The SL Undersea Lightguide System" ibid

Schulte, H. J. "Transmission Tests During the SL Lightguide Submarine Cable System Sea Trial" Proc. Soc. of Photo-Optic Instrumentation Engineers, August 1983

Corfield, K. G. "Submarine Cables: Past, Present, and Future" Communications International October 1983

Staff Article "Light Beneath the Waves" Telecom France, October 1983

Godeluck, J. "Optical Fiber Submarine Link" SUBMARCOM release, 1984

Preston, H. F. "International Telecommunications in Asia: Environment, Structure, and Progress" ComunicAsia/InfotechAsia Conterence May 1984

Schwartz, M. I. " Optical Fiber Transmission-From Conception to Prominence in 20 Years" IEEE Communications Magazine May 1984

Thomas, D. G. "Worldwide Telephony Over Lightwaves" Research and Development, June 1984

Staff Article "Trans-Atlantic Fiber Cable Will Compete with Satellites" Microwave Journal, July 1984

Shimura, S. "International Submarine Cable Systems" (book) KDD Engineering and Consulting, Inc. Tokyo 1984

Cableship VERCORS is part of the fleet of the Ministry of Posts and Telegraphs of France. One of the larger cable-layers, VERCORS is equipped to handle the sea-bottom plow used to sequester cables beneath the sea floor. Commissioned in 1974, VERCORS has been joined recently by the two newest French cableships LEON THEVENIN and RAYMOND CROZE.

LIST OF SIGNIFICANT CABLESHIPS

SINCE 1900

Cableships--and conversions to cableships--are listed here in approximate chronological order.

The Ship Reference Number is taken from this contractor's data files and is as seen in his book Cableship Characteristics (Second Edition, 1980). The first two digits indicate the decade, i. e., 00=1900-1909, 10=1910-1919, and the second two digits are assigned to the vessel, to remain throughout the life of the ship.

Date A is the year built or commissioned, or re-named

Date B is the year retired, or lost, or sold out of the cable world.

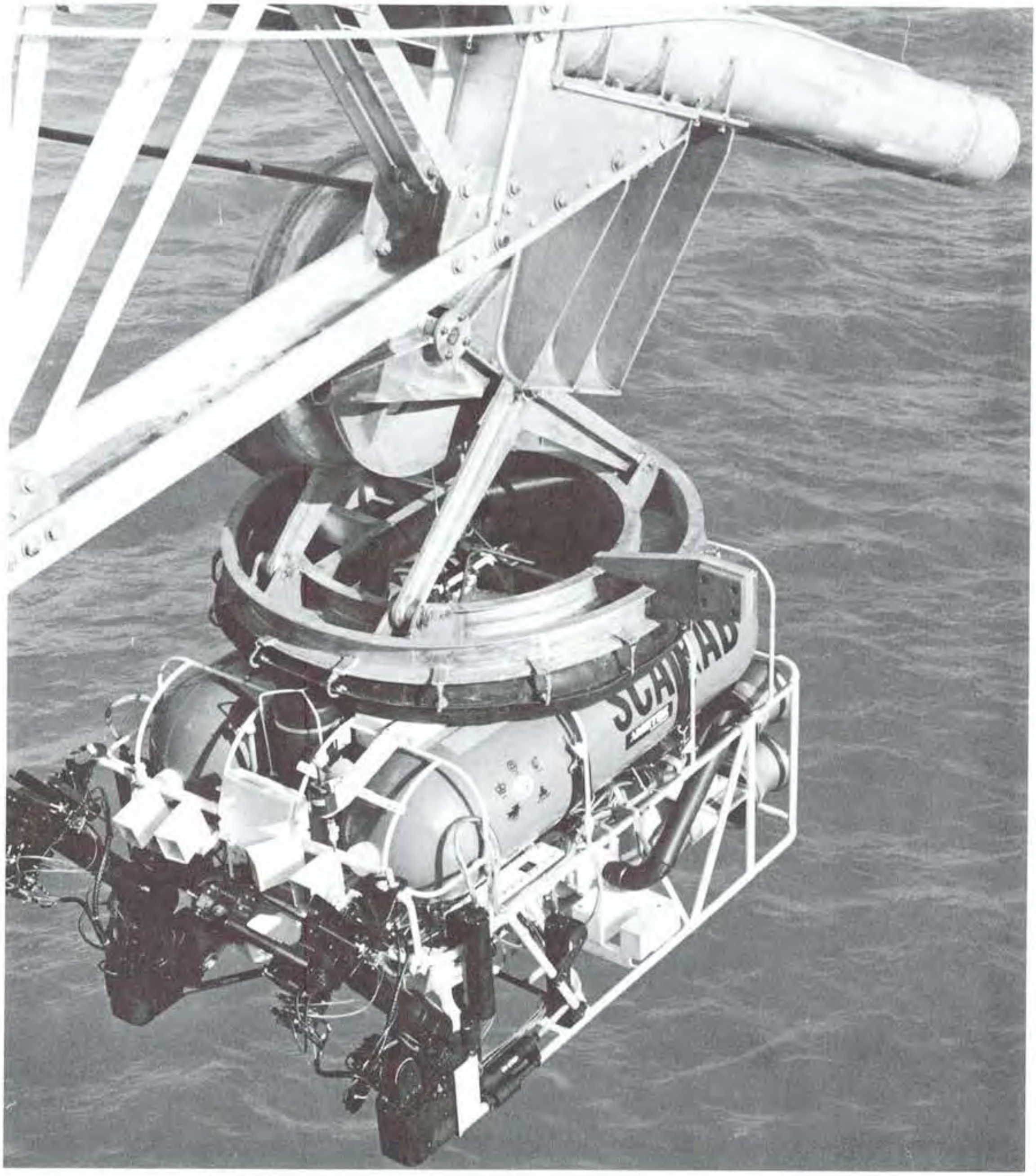
SHIP REFERENCE NUMBER	NAME(S)	DATES A	DATES B
0001	JOHN PENDER (2)	1900	1928
0002	IRIS (1)	1902	
	AS RECORDER (2)	1929	1952
0003	COLONIA	1902	1928
0004	LADY LAURIER	1902	1959
0005	STEPHAN	1902	1926
0006	HENRY HOLMES	1903	1950
0007	PACIFIC	1903	1935
0008	PATROL	1903	1933
0009	RESTORER	1903	1952
0010	CAMBRIA	1905	1945
0011	GROSS HERZOG VON OLDENBURG	1905	
	AS CITTA DI MILANO	1919	1943
0012	CORMORANT (2)	1906	1922
0013	OGASAWARA MARU	1906	1945
0014	SENTINEL	1906	
	AS SENTINEL II	1918	1924
0015	GUARDIAN	1907	1940
0016	JUAN	1908	
	AS BJORNOY	1934	
	AS REINA	1937	
	AS CASTILLO OLMEDO	1939	
	AS CABLESHIP	1944	1968
0017	JOSEPH HENRY	1909	
	AS THALIS O MILISSIOS	1946	
0018	RETRIEVER (3)	1909	1940
0019	SAMUEL MILLS	1909	
	AS PEQUOT	1922	1922
0020	TELCONIA	1909	1932
0021	VIKING	1901	1945
0022	LOUISE	1904	
	AS MAGNET, AS CABLESHIP	1904	1923
0023	CORMORANT (1)	1903	1908
1001	RAMOS	1912	1945
1002	EDOUARD JERAMEC	1913	
	AS PIERRE PICARD	1945	1952
1003	TRANSMITTER	1914	
	AS ARAGO	1932	1946
1004	NORDENEY	1915	
	AS CABLESHIP	1922	
	AS ALERT (3)	1945	1960
1005	LORD KELVIN	1916	1966
1006	MONARCH (3)	1916	1945
1007	EMILE BAUDOT	1917	1962
1008	ALERT (2)	1918	1945
1009	ESKILL	1911	
	AS JEHANDER NO. 5	1946	
	AS OSLANDSAND	1952	
	AS CABEL	1970	
	AS ETTAN	1971	
	AS KABEL (2)	1974	1979
1010	WAR SIMOON	1918	1919
1011	KABEL (1)	1918	1940
2001	KARLA	1920	
	AS CABLESHIP	1941	1947
2002	LADY DENISON PENDER	1920	1963
2003	ALL AMERICA	1921	1961
2004	EDOUARD SUENSON	1922	1968
2005	JOHN W MACKAY	1922	
2006	MARIE LOUISE MACKAY	1922	1961
2007	RAMPINO	1922	
	AS CABLESHIP	1943	1953
2008	STORE NORDISKE	1922	
	AS OHTAKA	1969	1972
2009	FARADAY (2)	1923	1941
2010	MIRROR (2)	1923	1964
2011	UNASSIGNED		
2012	UNASSIGNED		
2013	NORSEMAN (4)	1923	1964
2014	CABLE ENTERPRISE (1)	1924	1960
2015	CYRUS FIELD	1924	1966
2016	THE CABLE	1924	1935
2017	ZUIDERKRUIS	1924	1938
2018	NANYO MARU	1925	1944
2019	DOMINIA	1926	
	AS NIKOLAI EJOV	1937	XXXX
2020	NEPTUN (1)	1926	1945
2021	LANDEGO	1927	1942
2022	GIASONE (1)	1929	1940
3001	AMPERE (2)	1930	1944
3002	MATAI	1930	1963
3003	MANKO MARU	1934	1963
3004	ELLERY W NILES	1937	
	AS F V HUNT	1937	
	AS CABLESHIP	XXXX	1977
3005	ELVESHORN	1937	
	AS POOLSTER (1)	1946	
	AS INGENIEUR-EN-CHEF HANFF	1947	1953

3006	JOP	1937	1950
3007	TOYO MARU	1937	1945
3008	DIETRICH AHRENS	1938	1945
3009	HOWEWEG	1938	1944
3010	LASSO	1938	1959
3011	NORDERAU	1938	
	AS KLAVDIA NIKOLAEVA	1945	XXXX
3012	ALSACE	1939	1972
3013	ARIEL	1939	1973
3014	WESTERN UNION	1939	1974
3015	UNASSIGNED		
3016	NEUENFELDE	1939	
	AS CABLESHIP	1954	1958
4001	BULLFINCH	1940	1975
4002	IRIS (2)	1940	1976
4003	C E KRARUP (2)	1941	1961
4004	GIASONE (2)	1941	
	AS D'ARSONVAL	1945	1965
4005	KONGO MARU	1941	1945
4006	OSEI MARU	1941	
	AS CABLESHIP	1946	1953
4007	TSURUSHIMA MARU	1941	1968
4008	BUTJADINGEN	1942	1945
4009	KAIKO MARU	1942	1956
4010	MURRAY (ACM 9)	1943	
	AS TRAPPER (WARC 333)	1944	
	AS YAMACRAW (ARC 5)	1950	1965
4011	BASIL O LENOIR	1944	1973
4012	BULLFROG	1944	
	AS RETRIEVER (4)	1946	
	AS CABLE RESTORER	1961	
4013	COLONEL WILLIAM A GLASSFORD (AG 142)	1944	
	AS NASHAWENA (YAG 35)	1944	
	AS OMEGA	1960	1971
4014	TESSY	1944	
	AS DELFIN	1957	
	AS TESSY	1961	
	AS KABEL JAU, AS CABLESHIP	1966	1971
4015			
4015	STANELCO	1944	1969
4016	ST MARGARETS	1944	
4017	BULLHEAD	1945	
	AS ELECTRA (2)	1946	
	AS CABLE GUARDIAN	1959	1964
4018	SUIEI MARU NO. 5	1945	
4019	WILLIAM H G BULLARD	1945	
	AS NEPTUNE (ARC 2)	1953	
	AS NEPTUNE (T-ARC 2)	1973	
4020	ALBERT J MYER	1946	
	AS ALBERT J MYER (T-ARC 6)	1966	
4021	MONARCH (4)	1946	
	AS SENTINEL (2)	1971	1977
4022	TURANDOT (AKA 47)	1946	
	AS AEOLUS (ARC 3), AS CABLESHIP	1954	
	AS AEOLUS (T-ARC 3)	1954	
4023	VANADIS (AKA 49)	1946	
	AS THOR (ARC 4), AS CABLESHIP	1954	
	AS THOR (T-ARC 4)	1973	1975
4024	SORKABEL	1947	
4025	CHIYODA MARU	1948	1974
4026	HUMMEL	1948	
	AS CABLESHIP	1948	1964

4027	NORDKABEL (1)	1948	1969
4028	EMPIRE FROME	1948	
	AS OCEAN LAYER, AS CABLESHIP	1953	1959
4029	POOLSTER (2)	1948	1969
4030	EDWARD WILSHAW	1949	1979
4031	OLWE	1940	
	AS CABLESHIP	1943	1945
4032	LSM 275	1944	
	AS PORTUNUS (ARC 1), AS CABLESHIP	1952	
	AS MEDUSA	1959	1959
5001	DAME CAROLINE HASLETT	1950	
5002	AMPERE (3)	1951	
5003	IRMGARD PLEUGER	1952	1953
5004	STANLEY ANGWIN	1952	1972
5005	RECORDER (3)	1954	
5006	TSUGARU	1955	
5007	PRESIDENT KRUGER	1955	
	AS NEPTUN (2)	1959	1961
5008	NORDENHAM	1956	
	AS CABLESHIP	1956	1963
5010	SETO MARU	1956	
5011	TELEKABEL	1958	
5012	SEITOKU MARU NO. 1	1959	
6000	PHOTINIA	1961	
	AS CABLESHIP	1962	
6001	AMAKUSA MARU	1960	
6002	ALERT (4)	1961	
6003	MARCEL BAYARD	1961	1981
6004	PETER FABER (2)	1961	
6005	RETRIEVER (5)	1961	
6006	INGUL	1962	
6007	JANA	1963	
6008	MERCURY	1962	
6009	NEPTUN (3)	1962	
	AS CABLE VENTURE	1976	
6010	SIRPA DAN	1962	
	AS NORTHERN, AS CABLESHIP	1968	
6011	LONG LINES	1963	
6012	CABLE ENTERPRISE (2)	1964	
6013	JOHN CABOT	1965	
6014	SAKATA MARU NO. 12	1965	
6015	PEGGY G	1966	1981
6016	KDD MARU	1967	
6017	DIRECTEUR GENERAL BAST	1969	
6018	ZNA	1969	
6019	TSUGARU MARU	1969	
6020	DONETS	1969	
6021	ZEYA	1969	
6022	NORDKABEL (2)	1969	
6023	PUTSAARI	1965	
6024	DENKO MARU	1969	
7001	KATUNJ	1974	
7002	MONARCH (5)	1974	
7003	IRIS (3)	1975	

7004	UNASSIGNED	
7005	TAVDA	1977
7006	INGURI	1978
7007	YOUDIAN YIHAO	1976
7008	VERCORS	1975
7009	NEWTON	1975
7010	SKAGERRAK	1976
7011	KUROSHIO MARU	1976
7012	UNASSIGNED	
7013	UNASSIGNED	
7014	UNASSIGNED	
7015	SEELEICHTER 1	1971
7016	UNASSIGNED	
7017	ELEKTRON	1969
7018	RAVENSWORTH AS FLEXSERVICE, AS CABLESHIP	1960 1975
7019	UNASSIGNED	
7020	APACHE	1979
7021	FUTAMI	1979
7022	SETOUCHI MARU	1979
8001	MUROTO	1980
8002	EMBA	1980
8003	NEPRYADVA	1981
8004	SETUN	1981
8005	ZEUS (T-ARC 7)	1984
8006	PETER FABER (3)	1982
8007	PACIFIC GUARDIAN	1984
8008	UNNAMED (GREECE)	XXXX
8009	UNNAMED (U S A)	XXXX
8010	UNNAMED (U S A)	XXXX
8011	RAYMOND CROZE	1983
8012	LEON THEVENIN	1983
8013	UNNAMED (T-ARC 8)	XXXX
8014	KOYOO MARU	1984

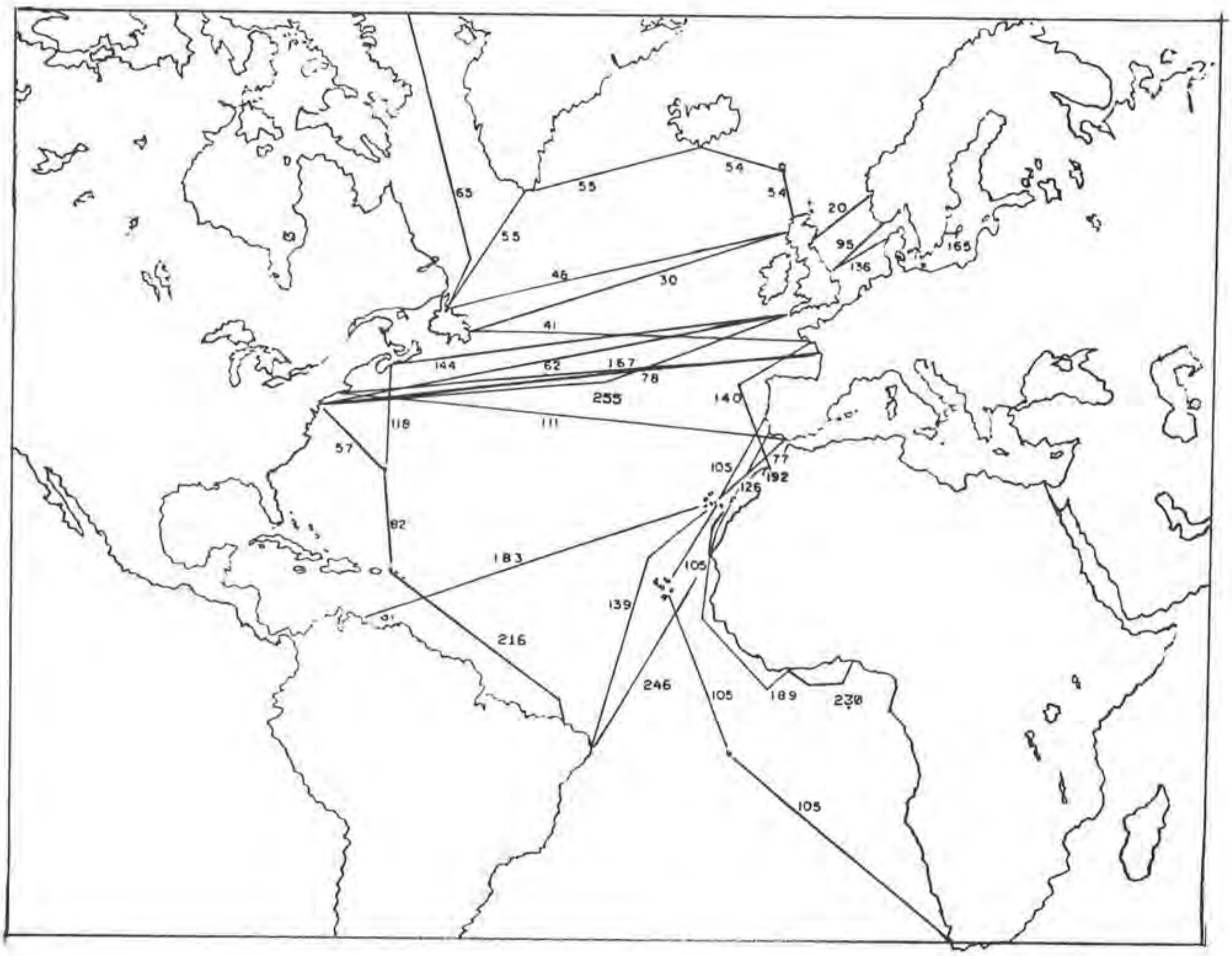
END



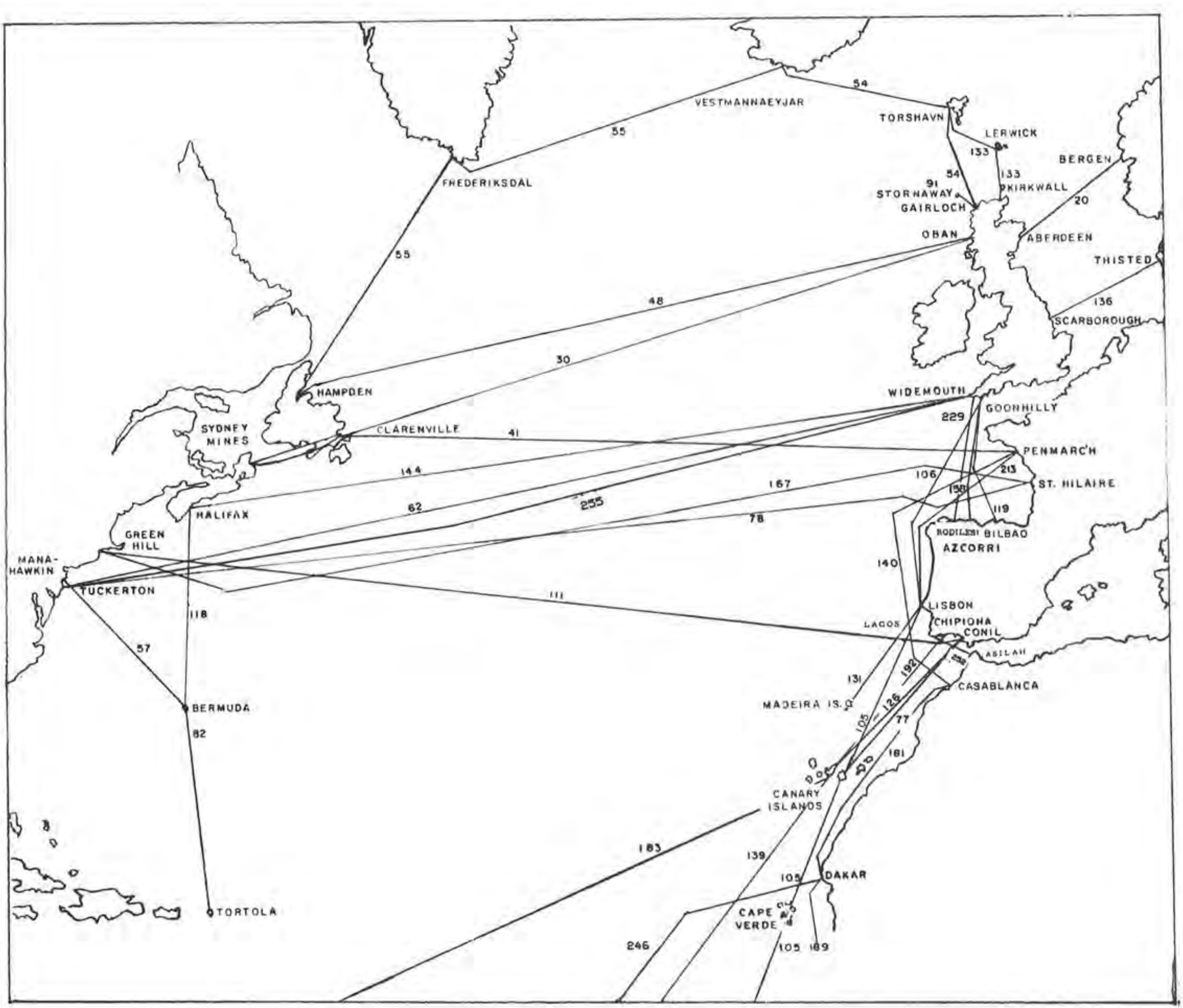
Since about 1970 there has been increasing utilization of remote-controlled undersea vehicles for various tasks in cable work, such as inspection of the burial of cable and submerged electronic units, and the location and retrieval of buried cable. Here is seen the unmanned submersible vehicle SCARAB being deployed from cableship SENTINEL just before the retirement of that ship in 1977.

MAPS OF SUBMARINE TELEPHONE CABLE INSTALLATIONS

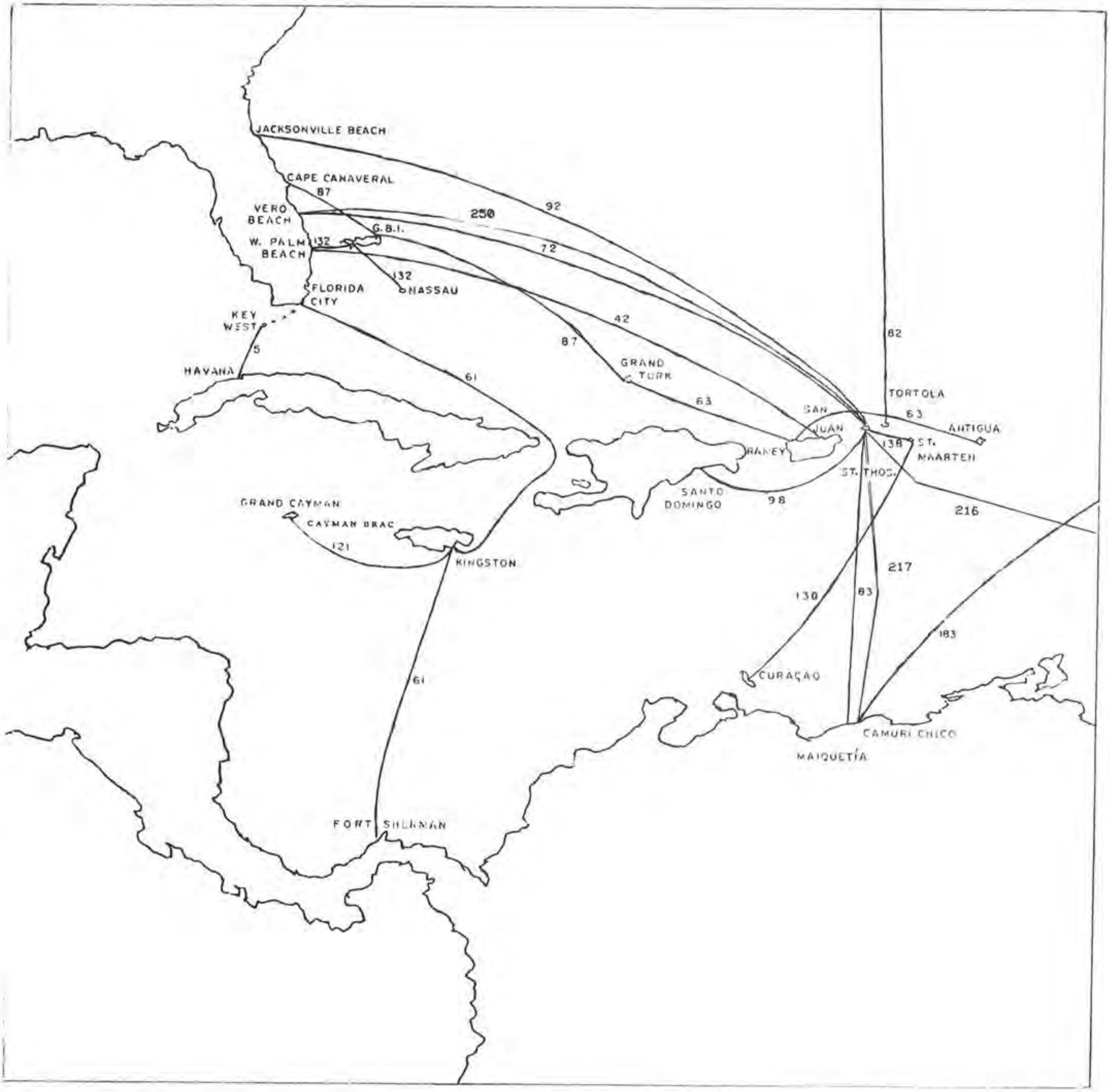
It is impossible to portray with clarity all of the world's submarine telephone cable systems on a single map. Therefore a collection of regional maps has been assembled, and is presented in the following pages.



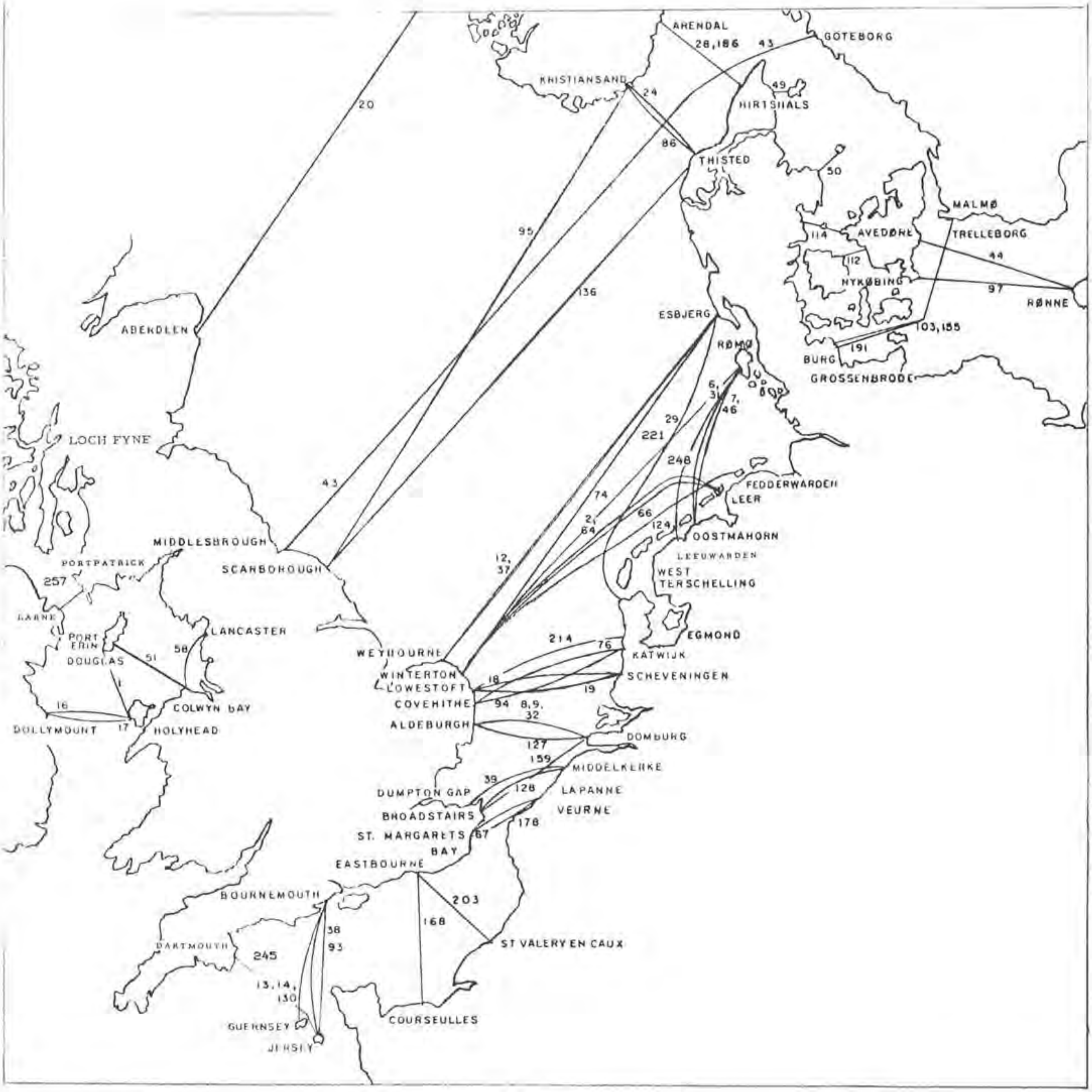
ATLANTIC OCEAN



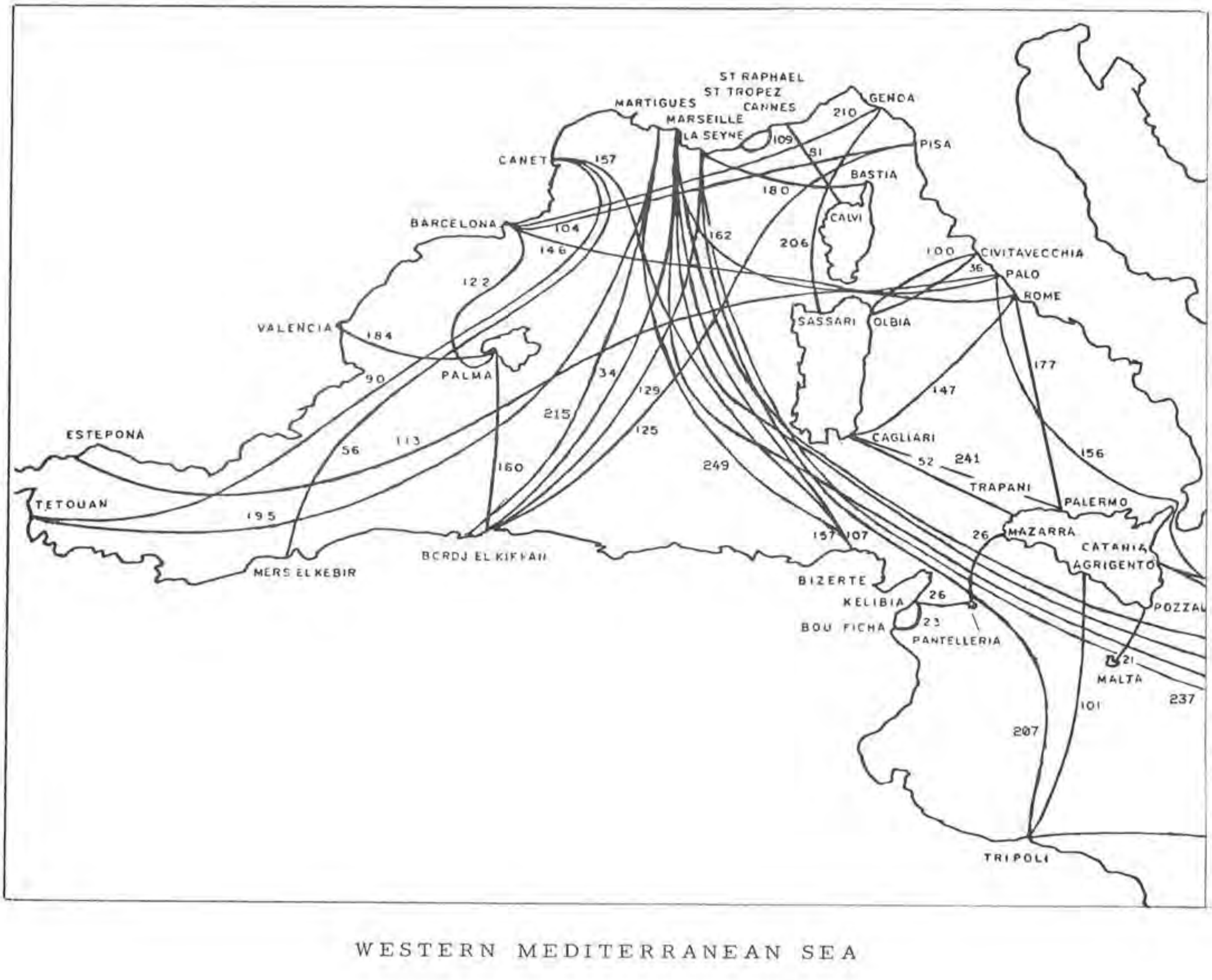
NORTH ATLANTIC OCEAN.



WEST INDIES - CARIBBEAN SEA



UNITED KINGDOM - NORTHERN EUROPE



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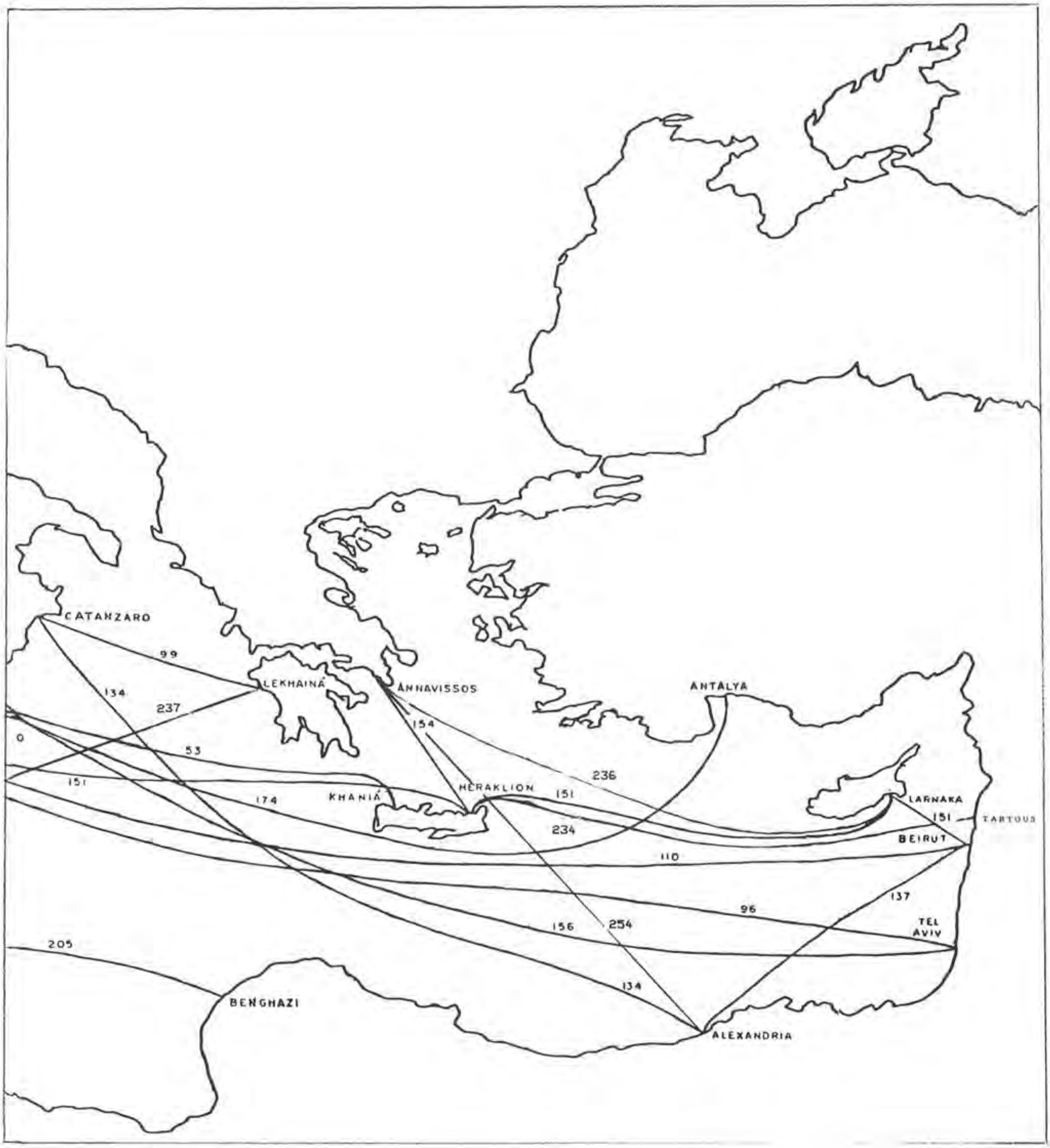
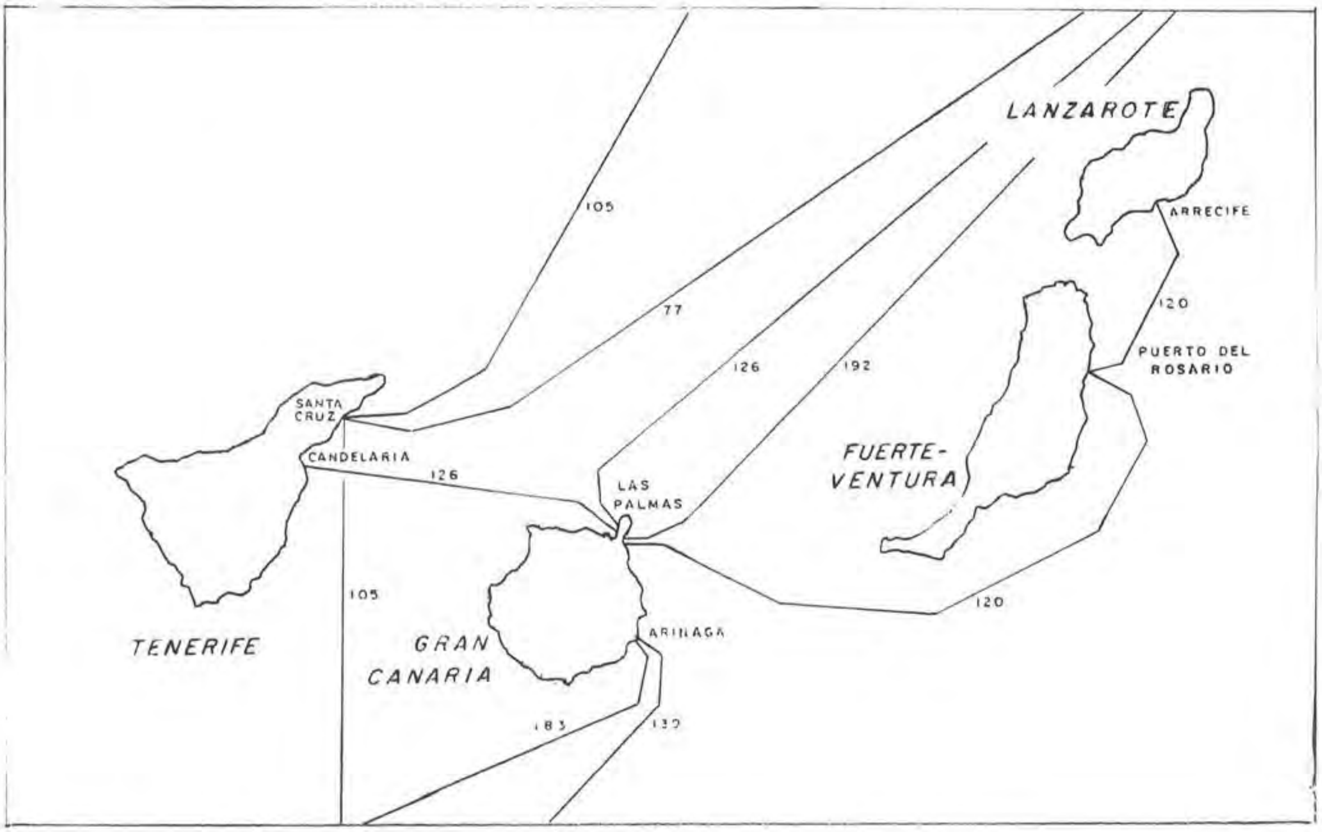
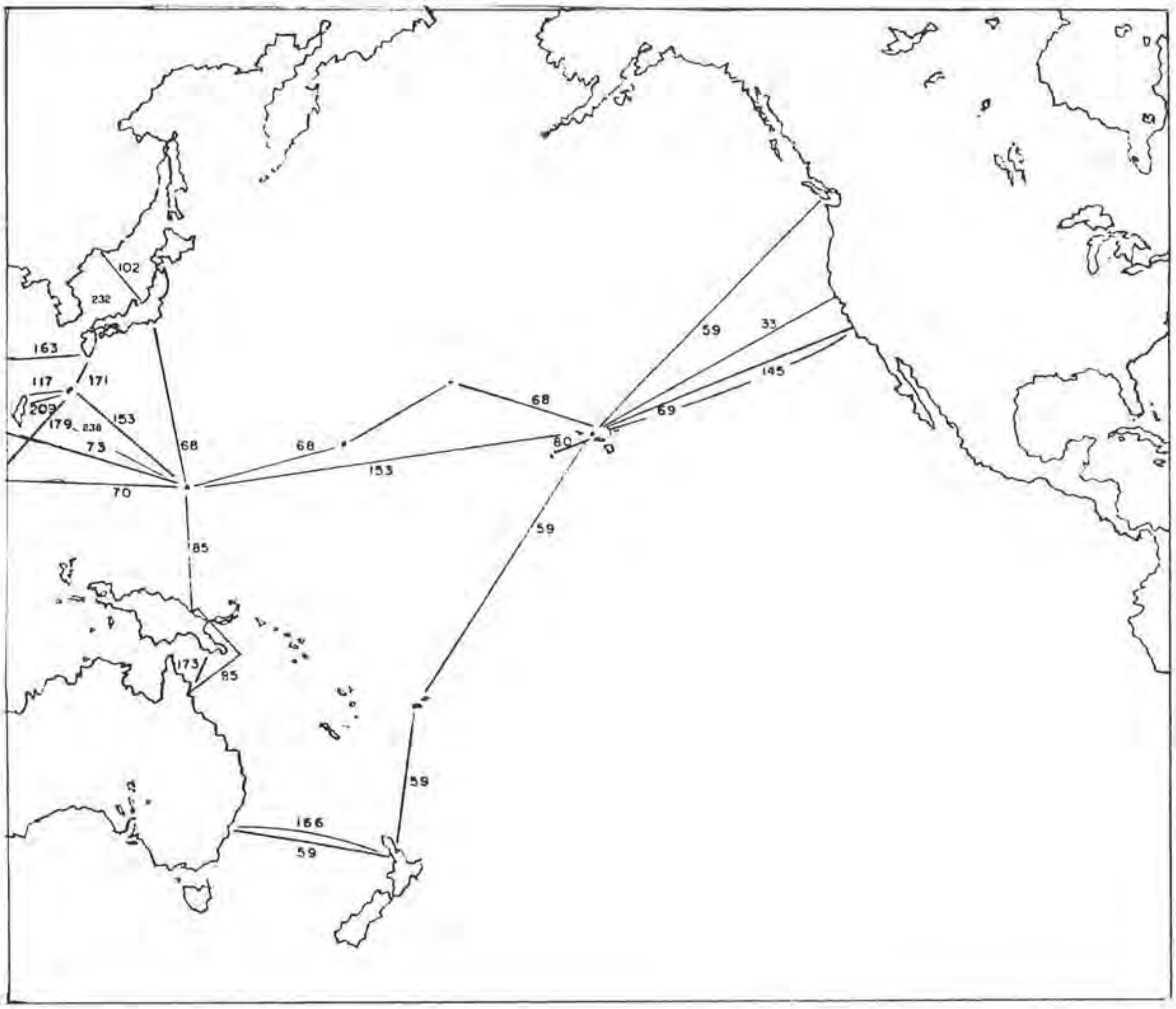


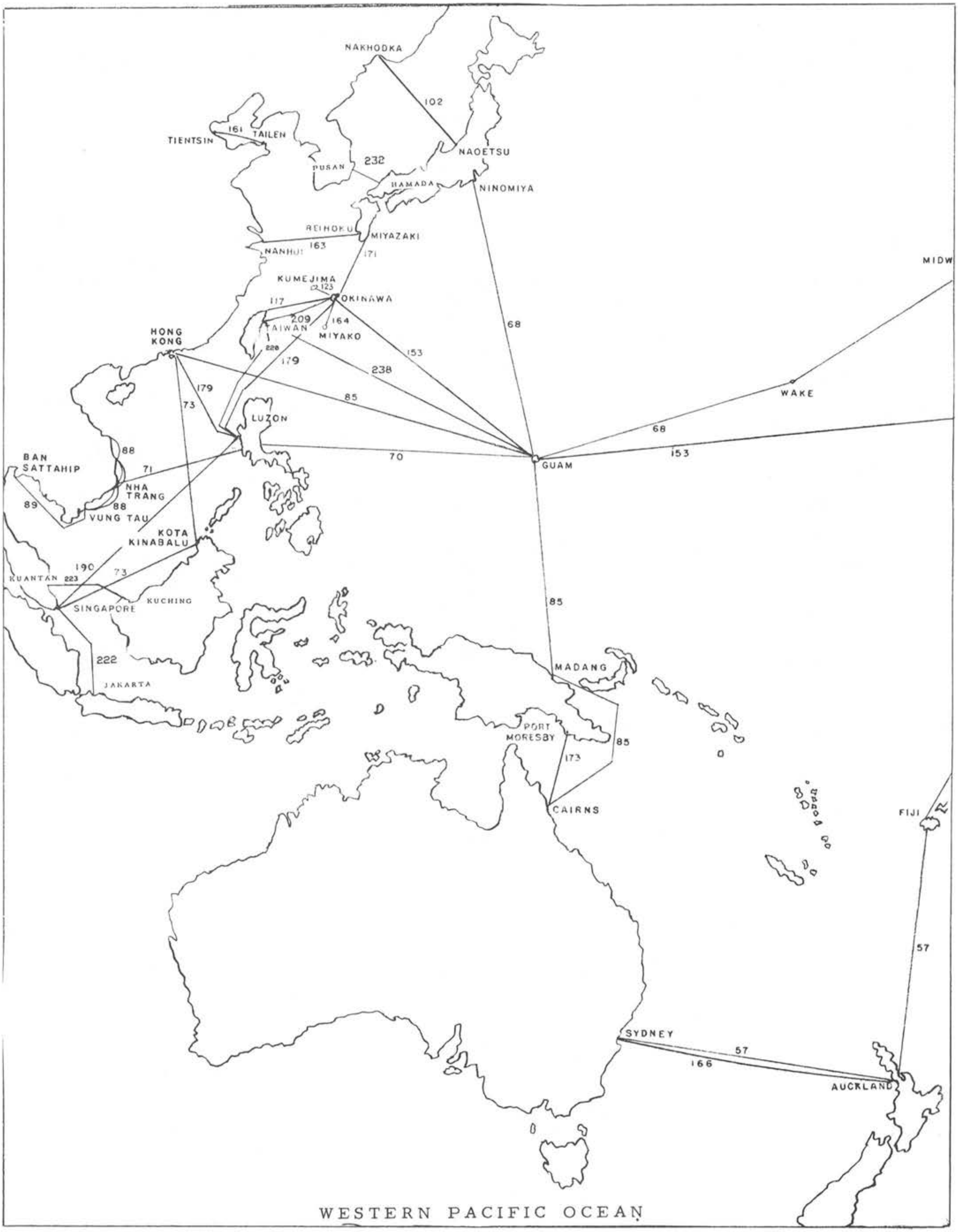
EASTERN MEDITERRANEAN SEA



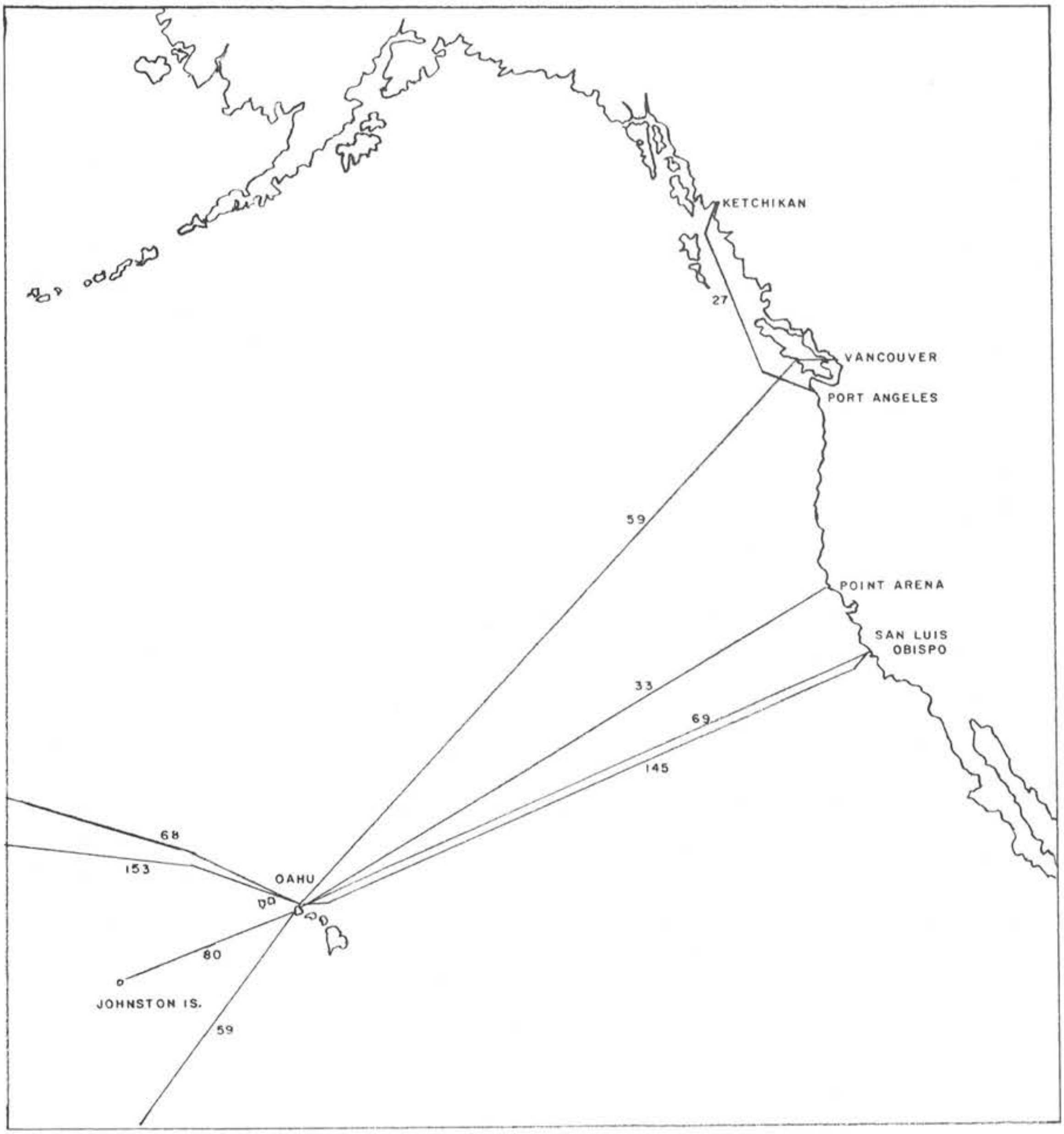
CANARY ISLANDS



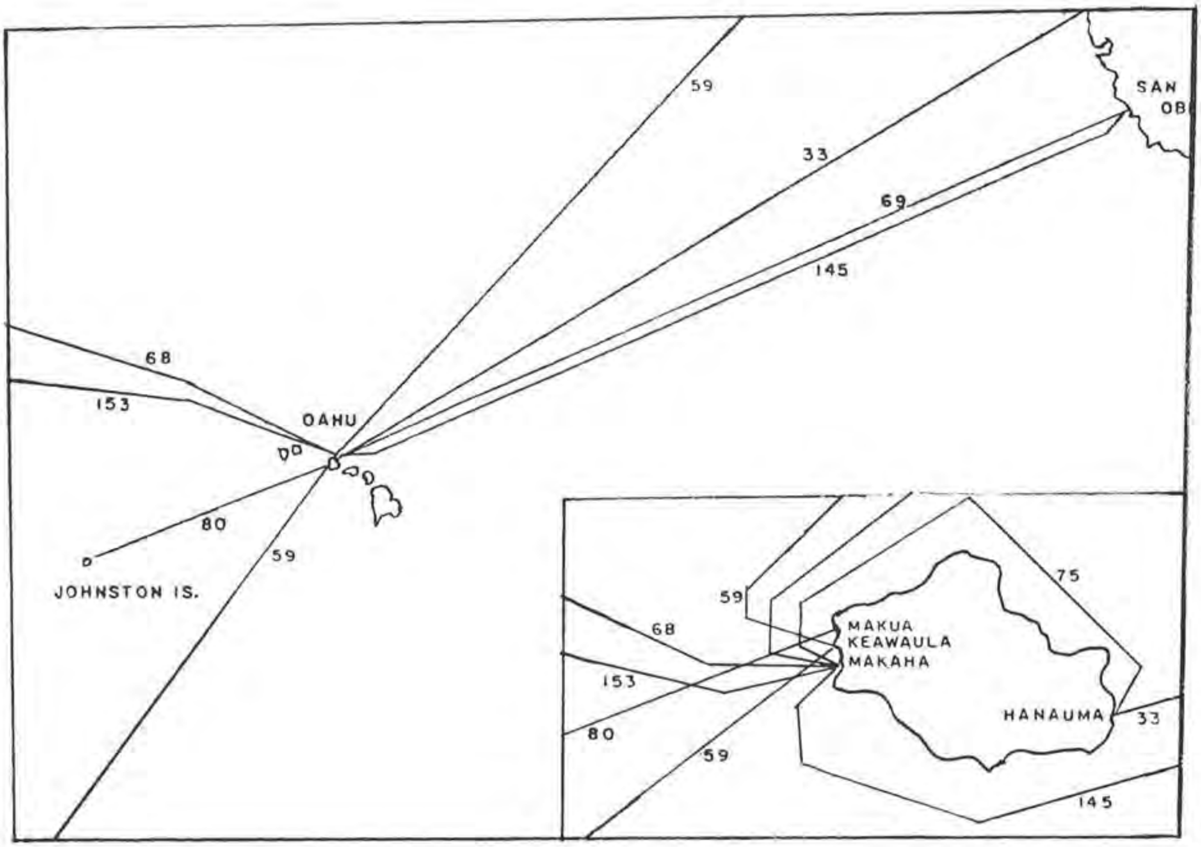
PACIFIC OCEAN



WESTERN PACIFIC OCEAN



EASTERN PACIFIC OCEAN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HANAUMA
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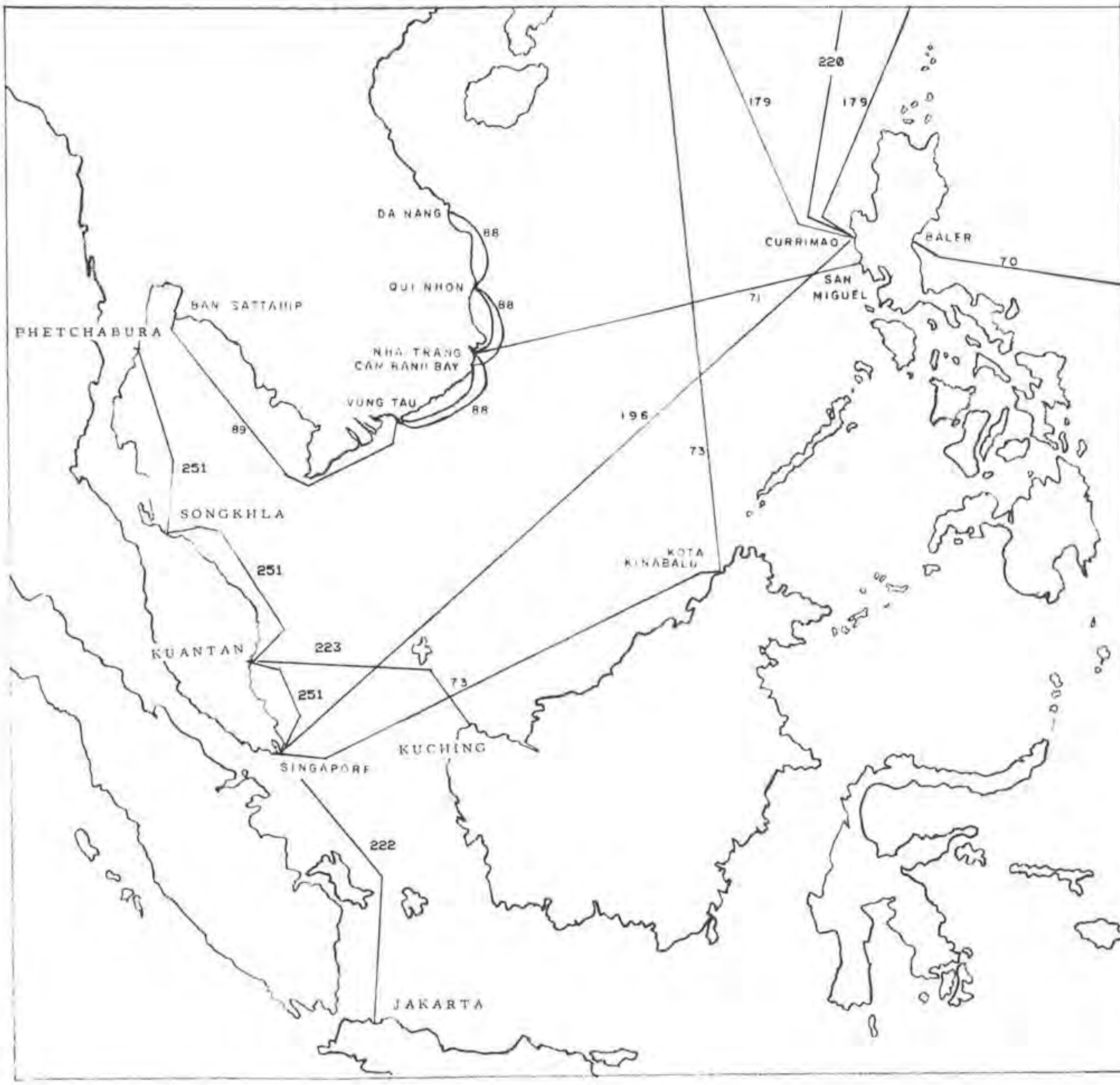
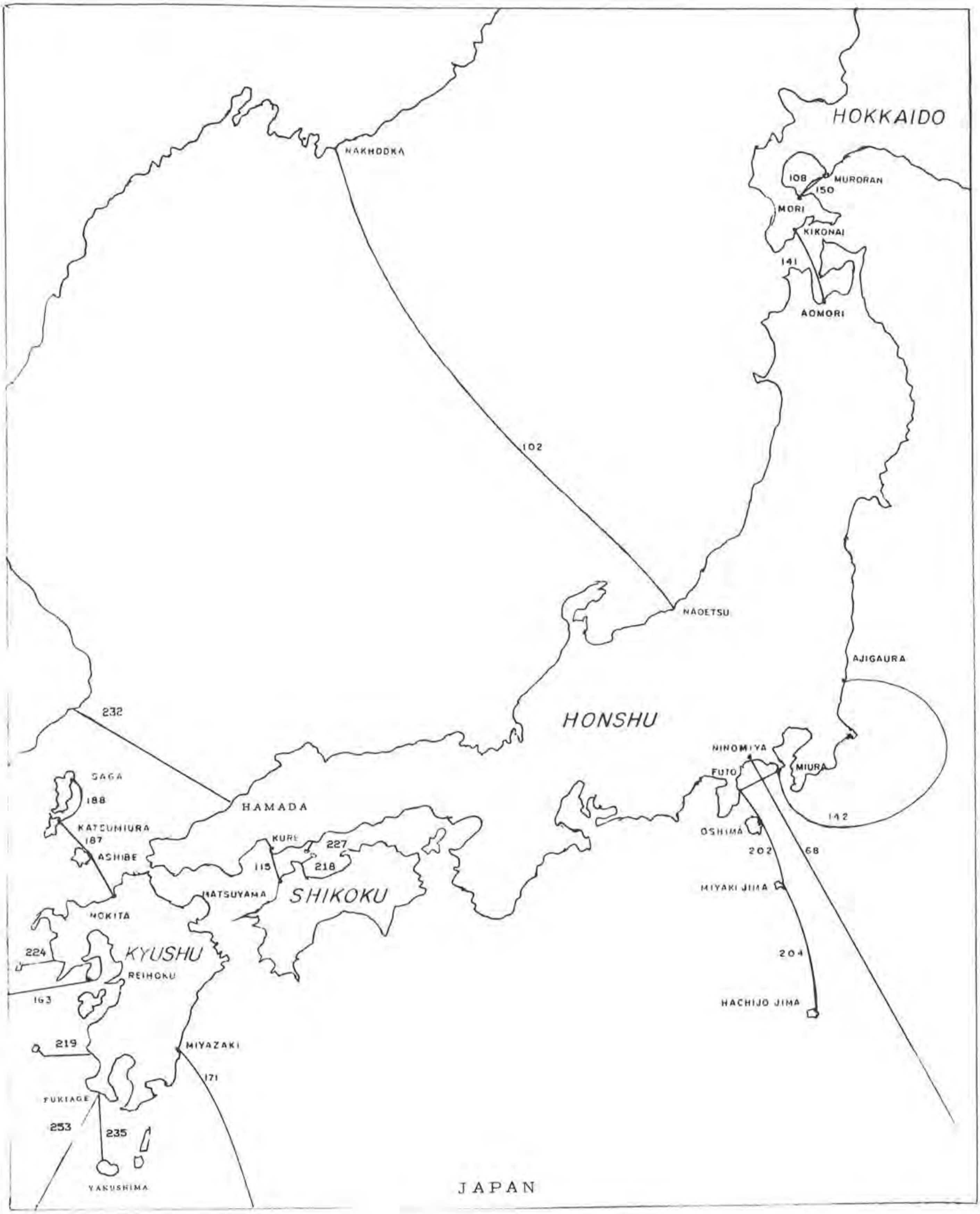
OAHU, HAWAII



SOUTHEAST ASIA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HONSHU
NINOMIYA
FUTO
MIURA
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OSHIMA
202
68
MIYAKI JIMA
204
HACHIJO JIMA
232
SAGA
188
HAMADA
KATSUMIURA
187
ASHIBE
KURE
227
218
115
MATSUYAMA
SHIKOKU
NOKITA
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REIHOKU
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MIYAZAKI
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FUKIAGE
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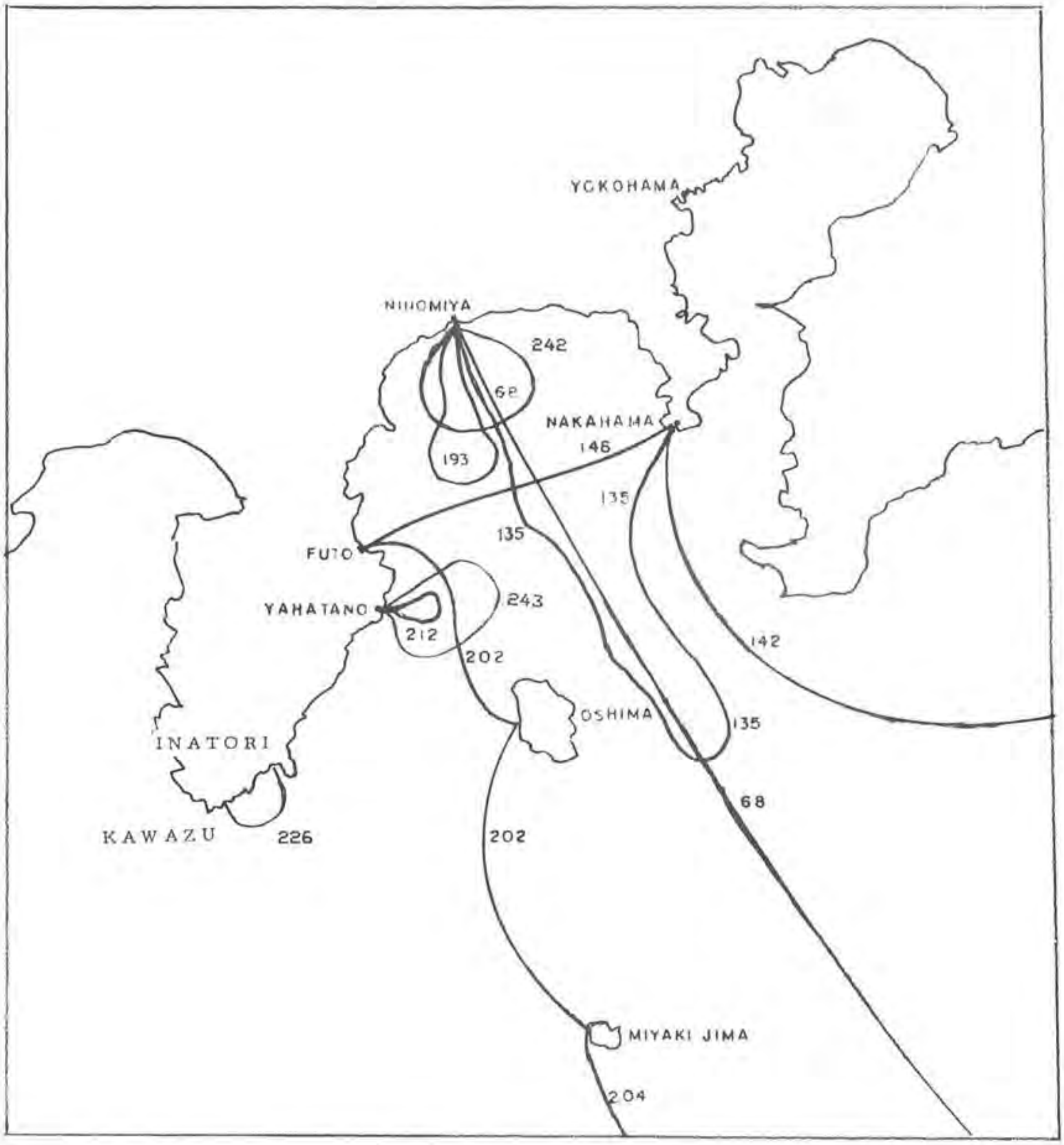
YAKUSHIMA
JAPAN



YOKOHAMA
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YAHATANO
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OSHIMA
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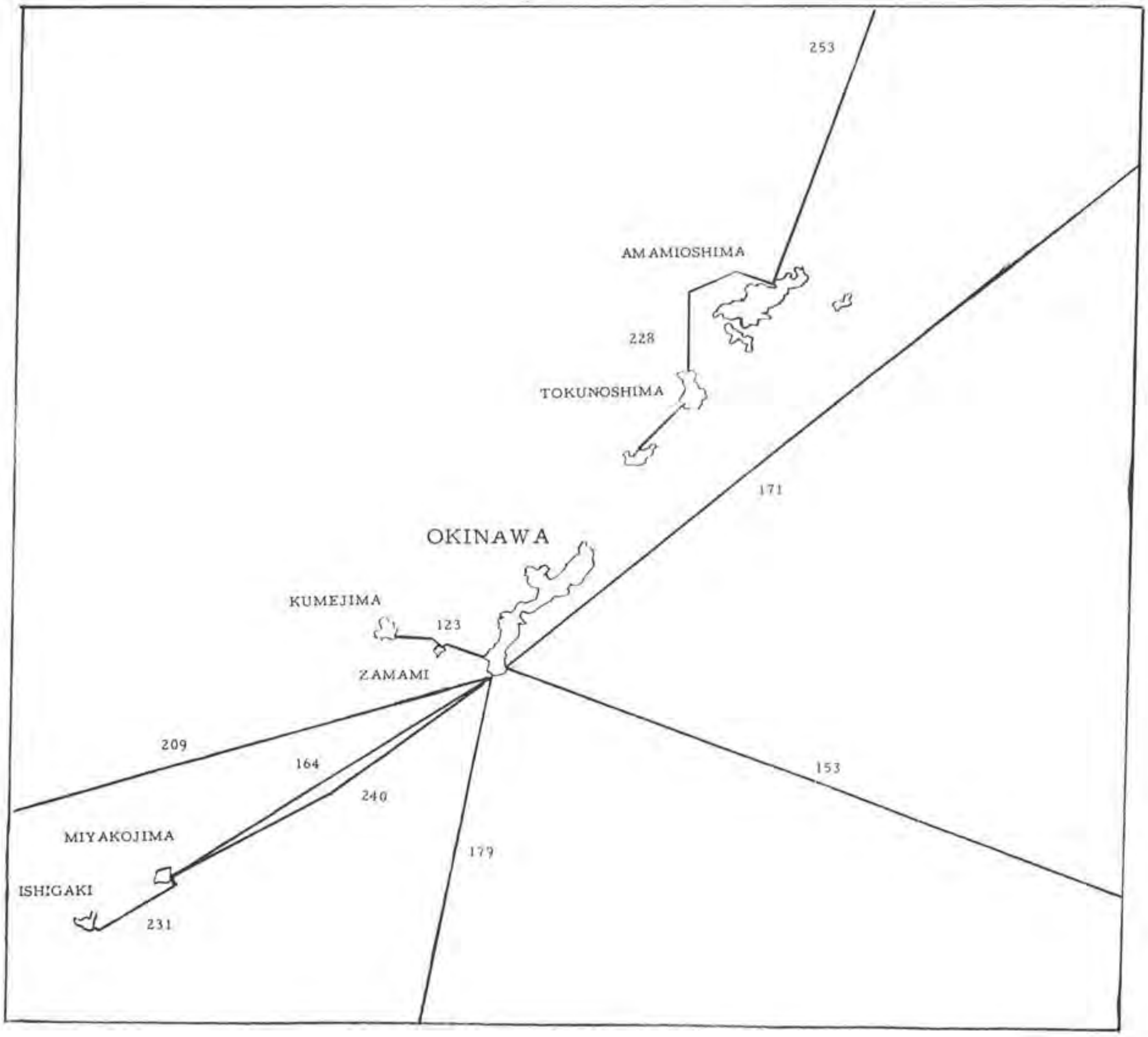
INATORI
68
KAWAZU
226
202
MIYAKI JIMA
204

SAGAMI BAY



OKINAWA

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