

JOE PROCKTON
67 BURMON DR.
ORCHARD PARK NY
14127

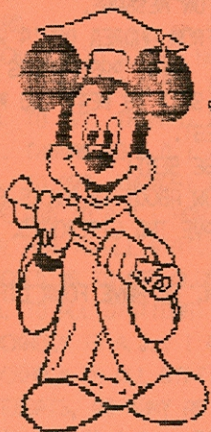
ALWAYS
USE ZIP CODE
TO



John W. Cullum Jr
6871 E. Webster Rd
Orchard Park NY 14127



VE TESTS TEST SITES

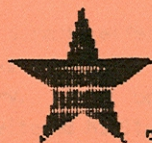


RAVE HOTLINE

876 - 6593

TESTS - SCHOOLS

- 9 Jan = RAWNY = Hal Freund = 834 6181
- 13 Apr = STARS = Hamburg Jr. High = 7:00 PM
- May = Rochester Hamfest
- Jul = Batavia Hamfest



TELSTAR

JANUARY 1988 - NO. 89

JANUARY

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HAPPY NEW YEAR

SOUTH TOWNS AMATEUR RADIO SOCIETY
OFFICERS AND BOARD OF DIRECTORS

President = Bill Siska = N26AD
Vice Pres. = Larry Shannon = K2KVS
Secretary = Dick Dukat = K2RDD
Treasurer = Mal Vallone = WA2VER
Fin. Secy. = Frank Modzelewski = KE2DG
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Director = Nick Stanko = KA2SEZ
Director (past President) = John Leitten = KA2RFT

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LIGHTNING

RELATED ARTICLES



The conclusion of the article "WE NEED BETTER LIGHTNING PROTECTION" by J. Anderson Plumer follows:

LIGHTNING EFFECTS

The effects lightning has on facilities and systems can be categorized as either direct or indirect effects. The direct effects include the physical damage lightning does to buildings and structural materials as the lightning current attaches to and passes through or across various structural materials.

Ignition of fires in wooden structures is perhaps the foremost example of a direct effect of lightning. Ignition occurs when the very hot — 20,000c — lightning channel comes in contact with combustible materials. The lightning's continuing current component is responsible for most ignitions because of its comparatively long duration.

Ignition of flammable vapors, such as exist within fuel oil or gasoline storage tanks and vent pipes, is another example of a direct lightning effect. Here, a small spark of just a few microseconds duration is capable of igniting flammable fuel-air vapors and causing a subsequent explosion.

Other types of direct effects include damage inflicted by the intense blast associated with stroke currents. These can shatter window panes, split tree trunks and other wooden objects, and dislodge bricks or

cement from masonry structures, such as tall unprotected chimneys. They also can strike outdoor lighting installations, causing lamps or globes to fracture; puncture inflatable structures; and melt holes in metal roofs and decks, causing leaks and fire hazards.

The direct effect that claims the most attention, of course, is the strike directly to or near a person that results in death or serious injury. This occurs most frequently in such locations as beaches, unsheltered hilltops, ball fields, and golf courses, where people are exposed to direct or nearby lightning strikes. People in and around buildings are not as susceptible because they generally are shielded by the structures.

Until recently, lightning protection technology dealt almost exclusively with the direct effects just described. Thus, lightning rods or "terminals" have been in common use since Benjamin Franklin's day, connected to the earth via copper or iron conductors. Even now, this technique is effective if properly implemented, and it is usually an important part of any lightning protection program. Side-bonding objects that are conductive within the protected structures has also been commonplace, and guidelines for installing these systems have appeared in lightning protection standards for many years.

During the past 50 years, it has also been apparent that lightning strikes can damage electric power transmission and distribution systems, as well as electrical equipment within homes and factories. Since this damage has usually resulted from direct contact of lightning with the power line and the subsequent conduction of lightning currents and voltages to the affected apparatus, it has been termed a direct effect.

Perhaps the most common effect of this type is the burnout or "explosion" of power distribution transformers. Burnout of electrical equipment such as refrigerator and fan motors, telephone switching equipment, and television sets due to direct conduction of lightning currents is also considered a direct effect or, more accurately, a direct electrical effect.

For protection against these direct electrical effects, the "lightning arrester" was developed. This device enables lightning currents to bypass the protected apparatus, usually to earth ground. The first light lightning arresters were spark gaps set to spark over at voltages lower than those that would damage the protected transformer or cause it to burn out.

Later, voltage-sensitive resistors, called varistors, were used for the

same purpose. The advantage of a varistor is that it can revert to a high-impedance state upon passage of the lightning surge, thereby preventing power from following the surges to the ground.

INDIRECT EFFECTS

Of at least equal concern are the indirect effects of lightning. These are caused primarily by increases in the electro-magnetic fields associated with the lightning currents and by increases in earth voltage that occur when a lightning strike dumps large amounts of electrical charges into the earth. Increases in both the electromagnetic fields and earth voltage have sufficient energy to cause burnouts or other failures in inadequately protected electronic systems.

Whether the magnetic fields and earth voltages can directly penetrate a building or some other structure depends upon the structure's construction. But even if the enclosure is made of a metal that reduces magnetic field penetration, the field may induce surges on exterior power or signal cables that would be conducted by the cables into the building.

Consider, for instance, a cable extending between two buildings, as shown in Figure 3.

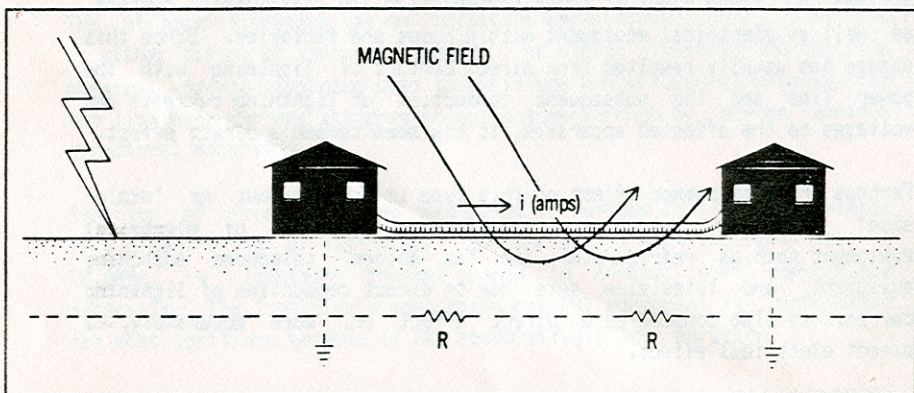


Figure 3. Magnetic fields link a cable between two buildings.

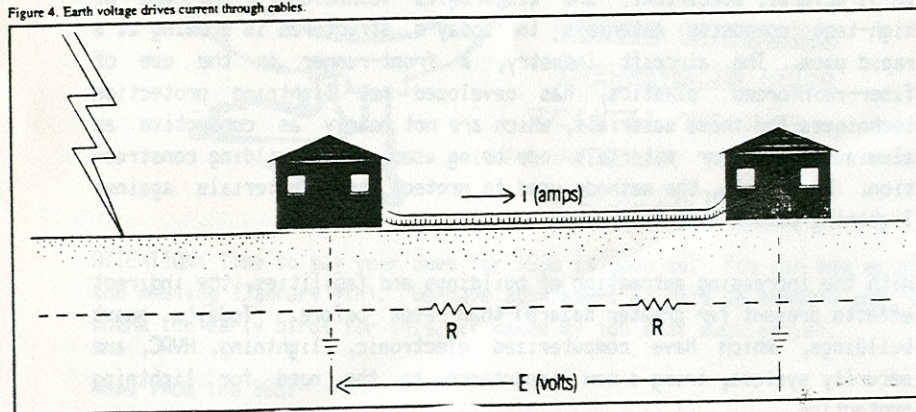
Here, a portion of the magnetic field from a nearby lightning stroke passes through the loop formed by the cable and the earth, inducing a current in the loop. The earth represented by a distributed resistance, R , at some finite distance below the actual surface. In reality, the induced current flows through a wide volume between the two shelters, but it will be sufficient to lump this into a single resistance for the purpose of this example.

The currents induced by an electromagnetic field will flow through the shield of a shielded cable or through the conductors of an unshielded cable. The significance of these currents becomes obvious when the cables are connected to sensitive electronic equipment. Relatively low current levels can burn out integrated circuits and other microelectronic components.

Adequate grounds for cable shields and conduits entering or leaving a building will allow most of the induced current to flow into the earth. However, a small portion may still enter a building and the equipment within, damaging sensitive components if additional protection is not provided. And although grounding has been an important role to play in lightning protection, much of the lightning literature to date has been excessively preoccupied with it, while overlooking other important aspects of successful lightning protection design as electrical bonding, surge suppression, and circuit design techniques that provide inherent immunity from indirect effects.

When there is an increase in the earth voltage, the potential difference between two adjacent buildings drives a current through the cables that extend between them. This is shown in Figure 4.

Figure 4. Earth voltage drives current through cables.



Because there are conditions under which earth voltages or magnetic fields from a nearby flash can drive up to several thousand amperes through interconnecting cables, these voltages and fields represent at least two mechanisms whereby lightning strikes can cause damaging surge voltages and currents in interconnecting cables, even when neither of the buildings is directly struck by lightning.

Most lightning-induced surges last less than 100 millionths of a second,

and their amplitudes may be small, sometimes less than 100 volts or amps if interconnecting wiring is routed with metal conduits or shields. However, surges as low as 20 volts or amps may be all that are necessary to damage solid-state electronic components. Smaller surges may also cause upset or loss of volatile memory in computers.

Systems particularly prone to interference or damage are those in which a central electronic package, such as a computer or processor controller, is connected by electrical cables to outlying stations. Of course, the AC power lines themselves may be sources of interference, and this makes nearly any electronic device that is powered from external power lines susceptible. Lightning arresters present at power distribution stations are there to protect the distribution transformers, and they do not necessarily protect the equipment beyond, which operates at low voltages. There are several mechanisms by which lightning surges may appear on incoming power distribution lines, and successful protection must take each of these mechanisms into account.

FUTURE TRENDS

Advances in lightning protection technology must keep pace with advances in structural, electrical, and electronics technology. The use of high-tech composite materials in today's structures is growing at a rapid pace. The aircraft industry, a front-runner in the use of fiber-reinforced plastics, has developed new lightning protection techniques for these materials, which are not nearly as conductive as aluminum. Similar materials are being used in new building construction. Here again, the methods used to protect these materials against lightning damage must be updated.

With the increasing automation of buildings and facilities, the indirect effects present far greater hazards than ever before. Today's smart buildings, which have computerized electronic, lightning, HVAC, and security systems, bring a new importance to the need for lightning protection.

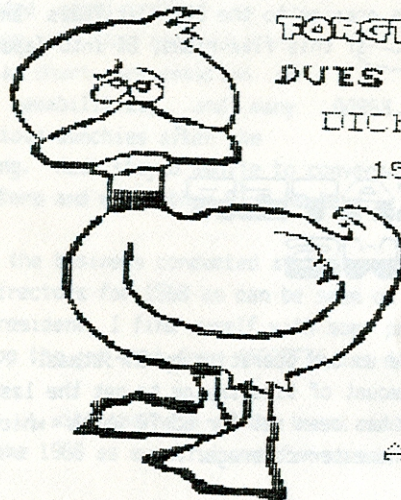
The responsibility for ensuring the highest degree of lightning protection lies with the architects and engineers of a building; with the facility's owners; with the designers, manufacturers, and installers of high-tech systems; with the facility's managers and plant engineers, who must maintain and upgrade protection to keep pace with new installations; and with the insurance industry, which must encourage loss prevention and minimize premiums.

The risks associated with adequate lightning protection are becoming

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ever greater, and the costs of repairs are skyrocketing. Lightning protection engineers and designers must keep abreast of the effects being experienced by the operators of today's facilities. Channels of communications need to be provided in order that protection designs may effectively address the problems being encountered now and those anticipated in the future.

This concludes the article on "WE NEED BETTER LIGHTNING PROTECTION". Hope that you got something out of it and describes how it comes about and some of the types of damages that you may not have encountered. Next month will have different systems of handling and 'grounding' the equipment.



**FORGET SOMETHING!
DUES PERHAPS...SEE**

DICK DUKAT, KERDD
15 SHERWOOD RD.
LANCASTER, NY
14086

**MAKE CHECKS
PAYABLE TO:
SOUTH TOWNS
AMATEUR RADIO
SOCIETY**

ATTENTION: Time to pay your dues for 1988 is upon us. You can see me at the meeting (January 7th). We have at present 43 paid up members and I thank the early birds for this, it makes my job that much easier.

News from the BBS:-

According to the Westlink report, Amsat has undertaken a crash program to build and launch an amateur packet satellite (packsat) within the next two years. A special fund is being set up to support this project. Meanwhile plans are on for the launch of a phase 3c satellite early next year.

We had a discussion at one of the meetings about radiation cable leakage in the two meter band. Word comes from Canada that Motorola Ltd. and the Canadian amateurs have protested this to the D.O.T. Results are that

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the television cable industry must move to fibre optic technology. What say, U.S.?

Stolen HT's from Rochester, NY

4 = UHF handhelds were stolen in Rochester, HT-440, set up on 466.475 and 461.475 mhz., chargers, speakermikes. Serial #'s = 432AGJ1147, 432AGJ1148, 432AGJ1150, and 432AGU1279. If anyone approaches you with a special deal on these units please contact Bill Carlton at The Pioneer Group in Rochester, NY or call 716-263-2660 or the Rochester police dept. DE KE2DI - Keith.

DX conditions

The solar flux is at 98 and 28 mhz is opening to the low latitudes and other transequatorial regions daily. If this flux rises, DX into Japan and northern Europe will improve.

73.....K2RDD



REPEATER NEWS

I would expect the new repeater to be up and operating by Christmas. I have been spending a considerable amount of time trying to get the last few hook-ups made. The output power has been set for 65-70 watts which should be sufficient to improve the repeater coverage.

I will try to maintain the same access codes as used with the current repeater until the end of January, at that time all codes will be changed over and all new features of the repeater will be available for use at that time.

"Bare-Bones" Repeater use instructions will be mailed to all MEMBERS in late January and "Expanded-Feature" use manuals will be mailed out shortly thereafter.

Above all else, USE THE NEW REPEATER, this will show our club off through increased exposure and will help me get the bugs out of the machine. If you have any problems with the repeater, please feel free to call me or K2RDD, Dick, or any Board Member to let us know that a problem has come up. We will try to get it rectified as quickly as possible.

Any comments, good or bad, regarding performance, will be appreciated.

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Please use the machine wisely, courteously and in a legal manner. Your patience will be greatly appreciated for the first few months of operation. Again, the repeater is there for your use, USE IT!!

Bill, N26AG, Repeater Chairman.

THE PREZ SEZ

Well the December meeting is history and I think it may hold the record for shortest meeting in STARS history. Those who attended were treated to a glimpse of the new repeater, with a short presentation of its capabilities, and many delicious munchies after the meeting. Most stayed awhile to converse with the new Club Officers and Directors and with other Club Members.



Among the business conducted at the meeting was installation of officers and directors for 1988 as can be seen on page 2 of this Telstar. As the new president, I find myself with some pretty BIG shoes to fill. How do you top the job that John (KA2RFT) has done for the past 2 years?

Well...., with the help of the board members and club members, I hope we can make 1988 as eventful and fun as was 1987.

Looking ahead I see several projects for the STARS in 1988, among them is a mini flea market in April to help the new Novice Class Graduates get on the air (and an opportunity for you to clear out some of the items in your shack). Early 1988 will be the learning period for the new 2 Meter Repeater, an event I am especially looking forward to. Also 1988 will be the year of the Repeater Bragg Message contest, (possibly) the world's biggest 2-Meter Net, more new antenna projects at the Nike Base, and yet another field day.

With the next few months will come the need to fill many committee positions such as Fair Station Chairman, Program Chairman, and very importantly 2 Ham-D-Rama Reps. Please keep these in mind, if you find that you are interested in one of these positions, call me or any board member to express your interests and any other ideas you may have for the club in '88 - as John said many times, "It's your club".

Don't forget, DUES ARE DUE NOW!!!! If you have not already paid, drop

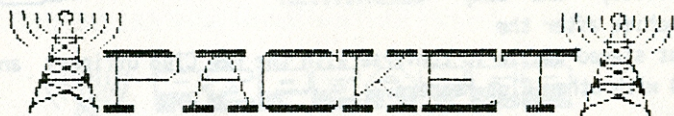
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your dues off at the January Meeting or mail them to Dick, K2RDD.

I am looking forward to 1988 and hope that we can make it one of the STARS strongest years yet. I would like to wish you and your family a very Merry Christmas and a prosperous New Year, and I hope that SA2NTA brings you all the ham radio toys on your Christmas List.

(To quote a phrase) STAY INVOLVED,
Bill, N2GAD
President.

General Meeting = 1st Thursday = 7:30 PM = Youth Center
Board Meeting = 4th Tuesday = 7:00 PM = Youth Center
75 Meter Net = Each Saturday at 10:00 AM = +/- 3925 knz
2 Meter Info Net = Each Wednesday 7:00 PM = 147.69/.09
Telstar deadline = 20th of the month



ARTICLE 2

MORE SPECIFICS ON EQUIPMENT REQUIRED

In the previous article, I briefly described a simple station and a full blown station. Here, I will try to describe the role each piece of equipment plays on the packet radio game, from the necessary to the optional. You may then be able to better decide the extent of equipment you would like at your station. I will, of course, concentrate on the most important piece of equipment, the TNC.

A) Terminal Node Controller or TNC - this is the heart of the packet system. Most TNCs, having microprocessors built into their circuit boards, are, in effect, computers themselves. Burned into the Memory Chip is the AX.25 protocol used by all packet systems. The protocol is an established and highly formal procedure which utilizes the microprocessor of the TNC to handle incoming and outgoing traffic, and works behind the scenes to provide the user with error free communications. How does it provide such perfect copy? At the beginning of each and every transmission, the AX.25 protocol tells the TNC to send a block of information containing such items as the sender's and addressee's call signs and the total number of "bits" of information to be contained in the entire packet transmission. This block of information precedes the actual message or file being sent by the operator. NOTE: Since identification is done on each transmission

automatically, it eliminates the need for the packet station operator to identify manually to conform to FCC regulations. Once the transmission is received by the addressee's TNC, the TNC evaluates the message by counting the number of "bits" received and comparing that to the number of bits the sender's TNC said it sent. If the numbers don't match, the addressee's TNC automatically requests a retransmission of the message of the message from the sender's TNC. Once the message is received perfectly, the addressee's TNC sends an acknowledgement or ACK back to the sender's TNC for confirmation of receipt of message.

On VHF, messages are sent at 1200 baud (or 1200 characters per second) and 300 baud on HF. Some multimode TNCs even allow you to run RTTY, Baudot, ASCII and more, in addition to packet.

B) Computer/Terminal - because the TNC has its own "computer" built in, a means for communications between the system user and the TNC along with selection of TNC operating functions, can be accomplished using a simple "dumb terminal" (ie: a keyboard/monitor that is used to support a small main frame system). This dumb terminal, however, does not allow for uploading and downloading of files and other software related functions.

Use of a computer terminal allows many functions external of the TNC such as file manipulation, storage of data in the computer's access memory, and automatic store and forwarding of files for "unattended operators", for traffic handling.

I recommend the use of a computer over a dumb terminal for convenience and flexibility of operation. Note: the computer must have a serial port (RS-232 signal) and a modem or terminal program which converts the data to and from ASCII code. Many packeteers use a Commodore 64 computer and do very well with it. Many of the TNC manufacturers will sell you terminal programs written especially for specific computers, their TNC, and packet radio, exclusively.

C) Printers - these help you make hard copies of the downloaded information. At 1200 baud, the text scrolls up the screen quickly and reading all information received can be difficult without a printer.

D) Monitor - monochrome or color monitors are satisfactory. Some terminal programs written for packet are in color to help offset text on the screen. Color, however, is not necessary.

E) Floppy Disk Drives - most packeteers use floppy disk drives. Since most information sent and received come in mass quantities or in the

form of programs, disk drives allow storage and retrieval of this information quickly and easily. Most terminal programs allow the user to upload and download files over the air to or from a disk at the touch of a function key.

Next month - on air protocol, digi-peaters, and bulletin boards.
Bill, N26AO



STARS GOSPEL COLUMN

The January 7th meeting is upon us and our new officers shall give us the plan of action for the upcoming year. First is the appointment of chairpersons for various committees; should you have interest in any of the committees see the president before the meeting and surely he can find a place for you.

Our novice classes are now over and we should not stop there, it would be nice should any decide to join the club to offer a helping hand to familiarize them with ham radio and enjoy their privileges. Presently, for one to take his/her novice test it is necessary to have TWO general or higher class license holders (unrelated to the testee) to conduct the test. We are very fortunate that one of our members Vince, KC2NY, has volunteered to set up schedules and give the tests. Should you know of anyone interested have them contact Vince. There is a possibility that handicapped persons can be tested in their own homes as well. If you know of anyone wishing to get started pass this info to them.

It appears that April will be a busy month for STARS, we always had a flea market each year whereas members can bring in their surplus articles to either trade or sell them to other members. You now have fair warning so if you don't have anything to sell then bring money and take something home, hi hi, one on this in upcoming months.

In addition, STARS shall conduct the FCC examination on Wednesday, April 13th, at seven PM. You must have a filled form 610 at time of test so please take note of this so that you won't miss out. This test is given

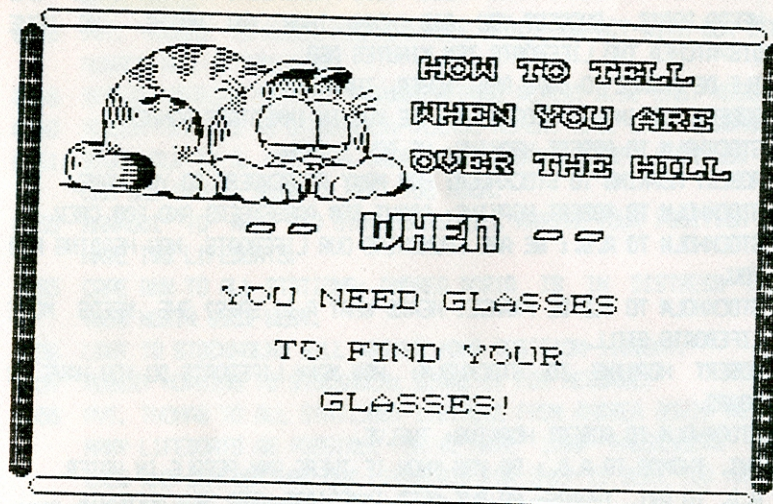
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to anyone, member or non-member, novice or higher so kindly pass this info along as well.

Hope that everyone enjoyed a peek at the repeater at our December meeting, sure looks like a FB job and the members should be proud of it. We endeavor to keep up with the state of the art and Bill, N26AO, repeater chairman, is sure helping us along. Dick, K2R00, has started a bulleting board on packet radio and inserts info about STARS that is submitted to him.

Both nets are in full swing, the two meter net Wednesdays at 1900 hours and the 80 meter (3925 +/- hkHz) net Saturdays 1000 hours - there is never a dull moment so please check in and enjoy yourself.

See You All Jan 7th
Guz, WB2E2U



THE SINKING OF THE ANDREA DORIA

by Raymond Maurstad, W2JNA/MM
on board the SS Robert E. Hopkins

(continued from the December issue)

YT
0444 PVT. THOMAS TO A.D.: WE HAVE YOU ON RADAR TEN MILES OFF, WE HAVE LIFEBOATS ABOARD.
0445 A.D. TO PVT. THOMAS: ROGER, THANK YOU.

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0448 CAPE ANN TO A.D.: WE HAVE LAUNCHED BOATS, THEY ARE COMING TO YOU,
PLAY LIGHTS ON THEM.
0449 CAPE ANN TO A.D.: SIGNAL FOR OUR BOATS COMING ALONGSIDE.
0455 PVT. THOMAS TO LAKE WORTH RADIO: STOP SENDING, THERE IS DISTRESS.
0456 CAPE ANN TO A.D.: LET US KNOW WHEN OUR BOATS ARE COMING BACK TO
OUR SHIP WITH PASSENGERS.
0457 ANDREA DORIA TO ALL STATIONS: HERE DISTRESS, IMMEDIATE NEED OF
LIFEBOATS.
0458 BOSTON COAST GUARD TO STOCKHOLM: WHAT IS YOUR SITUATION.
0459 CAPE ANN TO STOCKHOLM: DO YOU HAVE BOATS IN WATER.
0500 STOCKHOLM TO CAPE ANN: NO, NOT YET, WATCHING OUR NUMBER ONE HATCH
FULL OF WATER.
0501 ILE DE FRANCE TO CAPE ANN: SHALL BE NEAR DAMAGED ANDREA DORIA
0545GMT, WHAT CAN I DO FOR HELPING, SEVERAL BOATS READY SIGNED
MASTER.
0502 CAPE ANN TO ILE DE FRANCE: ANDREA DORIA SAYS SHE NEEDS IMMEDIATE
NEED OF LIFEBOATS FOR ABOUT 1000 PASSENGERS AND 500 CREW. SHE
NEEDS BOATS. SUGGEST YOU RIG MORE THAN TWO BOATS. WE HAVE
DISPATCHED TWO LIFEBOATS TEN MINUTES AGO.
0503 ILE DE FRANCE TO CAPE ANN: ROGER, THANK YOU.
0503 ROBERT HOPKINS TO STOCKHOLM: ARE YOU IN IMMEDIATE DANGER.
0503 STOCKHOLM TO ROBERT HOPKINS: WE DON'T KNOW.
0503 ROBERT HOPKINS TO STOCKHOLM: HOW MANY PASSENGERS DO YOU HAVE.
0503 STOCKHOLM TO ROBERT HOPKINS: ABOUT 550 PASSENGERS AND 200 CREW.
0508 STOCKHOLM TO A.D.: WE ARE LAUNCHING OUR LIFEBOATS, NOW HEADING FOR
YOU.
0509 STOCKHOLM TO ILE DE FRANCE: HEARD WHAT A.D. SAYS? SHE NEEDS MORE
LIFEBOATS STILL.
0510 ROBERT HOPKINS TO STOCKHOLM: HOW MANY LIFEBOATS DO YOU HAVE ON
BOARD.
0510 STOCKHOLM TO ROBERT HOPKINS: TWELVE.
0517 PVT. THOMAS TO A.D.: DO YOU KNOW IF THERE ANY PEOPLE IN WATER.
0518 A.D. TO PVT. THOMAS: NO BUT NEED IMMEDIATE NEED OF LIFEBOATS.
0519 PVT. THOMAS TO A.D.: WE ARE CLOSING IN AND HAVE LIFEBOATS READY.
0519 A.D. TO PVT. THOMAS: PLEASE HURRY.
0520 CAPE ANN TO A.D.: HOW CLOSE DO YOU WANT OUR SHIP TO COME.
0522 CAPE ANN TO ALL STATIONS: WE HAVE LAUNCHED TWO BOATS FOR A.D., NOW
PROCEEDING TO GET CLOSE TO HER.
0523 A.D. TO ALL STATIONS: (TRANSMITS MESSAGE BUT UNABLE TO READ).
0524 STOCKHOLM TO A.D.: I ACKNOWLEDGE YOUR MESSAGE.
0525 STOCKHOLM TO ALL STATIONS: A.D. SAYS -- DANGER, IMMEDIATE NEED OF
LIFEBOATS, AS MANY AS POSSIBLE CANNOT USE OUR LIFEBOATS.
0526 STOCKHOLM TO A.D.: HERE WE ARE LAUNCHING ALL LIFEBOATS TO HELP
YOU.
0527 STOCKHOLM TO ?: POSITION LATITUDE 4834 NORTH LONGITUDE 6945 WEST

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CLOSE TO A.D.
0529 CAPE ANN TO A.D.: DO YOU WANT OUR SHIP TO MOVE IN ANY CLOSER THAN
WE ARE NOW.
0530 STOCKHOLM TO ILE DE FRANCE: WE ARE ?? MILES FROM YOU, WILL LAUNCH
AS MANY BOATS AS POSSIBLE SIGNED MASTER.
0531 A.D. TO STOCKHOLM: I ACKNOWLEDGE MESSAGE FROM ILE DE FRANCE.
0533 PVT. THOMAS TO A.D.: OUR NUMBER ONE BOAT IS IN WATER, THIS BOAT
HAS A TRANSMITTER AND RADIO OPERATOR ON BOARD.
0534 A.D. TO PVT. THOMAS: ROGER, OK, THANK YOU.
0540 PVT. THOMAS TO A.D.: WE ARE ON YOUR STERN AND HAVE LIFEBOATS IN
WATER.
0541 STOCKHOLM TO ALL STATIONS: HER DANGER IMMEDIATE, NEED LIFEBOATS AS
MANY AS POSSIBLE, CANNOT USE OUR LIFEBOATS.
0543 ROBERT HOPKINS TO STOCKHOLM: I ACKNOWLEDGE SOS, WE ARE BOUND SOUTH
JUST GETTING NANTUCKET BEAM.
0546 PVT. THOMAS TO A.D.: OUR TWO MOTOR LIFEBOATS ON WAY OVER TO YOU.
0547 A.D. TO PVT. THOMAS: ROGER -- TELL OTHER SHIPS -- THOUSAND
PASSENGERS
0548 PVT. THOMAS TO A.D.: YOU CAN MAKE RADIO CONTACT WITH OUR LIFEBOAT
NUMBER ONE IF YOU NEED.
0548 ROBERT HOPKINS TO PVT. THOMAS: PLEASE REPEAT A.D. LAST MESSAGE.
0549 ROBERT HOPKINS TO STOCKHOLM: PLEASE REPEAT A.D. LAST MESSAGE.
0551 STOCKHOLM TO R. HOPKINS: ANDREA DORIA SAYS, DON'T KNOW HOW LONG WE
CAN USE RADIO, SHIP IS BENT TOO MUCH.
0553 MANAOUI TO A.D. AND STOCKHOLM: WILL ARRIVE YOUR POSITION 0900GMT
HAVE TWO LIFEBOATS.
0555 CAPE ANN TO ALL STATIONS: ANDREA DORIA IS IN DISTRESS POSITION
4830 NORTH 6953 WEST.
0556 LAUT TO STOCKHOLM: WILL ARRIVE YOUR POSITION 1100GMT.
0557 ROBERT HOPKINS TO STOCKHOLM: STAND BY FOR MESSAGE.
0558 PVT. THOMAS TO ALL STATIONS: DISTRESS FROM ANDREA DORIA WE NEED AS
MANY LIFEBOATS AS POSSIBLE FOR WE HAVE 1000 PASSENGERS AND 600
CREW AND CAN NOT USE OUR LIFEBOATS FOR SHIP IS BENT TOO MUCH.
0559 SLFA TO PVT. THOMAS: 4826 NORTH 7103 WEST.
0559 LAURA MARSK TO ALL STATIONS: (NO MESSAGE SENT)
0600 ROBERT HOPKINS TO STOCKHOLM: WE ARE NOW ABOUT 19 MILES EAST, WILL
ARRIVE YOUR POSITION ABOUT ONE HOUR, HAVE TWO LIFEBOATS.
0602 STOCKHOLM TO ROBERT HOPKINS: ROGER.
0602 ROBERT HOPKINS TO STOCKHOLM: CORRECTION, WE HAVE FOUR LIFEBOATS.

NEXT MONTH

continuation of
"THE SINKING OF THE ANDREA DORIA"

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