

ΑΝΑΚΟΙΝΩΣΙΣ ΜΗ ΜΕΛΟΥΣ

ΠΑΘΟΛΟΓΙΑ. — **General Statement on the "Teleelectrocardiograph",** from *A. Kanatsoulis**. Ἀνεκοινώθη ὑπὸ τοῦ κ. Σπ. Δοντᾶ¹.

Taking into consideration the actual possibilities of the Wireless, it is easy to understand how simple is the reception of an electrocardiographic message at a distance, when a proper apparatus is used. Naturally, such apparatuses must be specially built so as to obtain precision and stability and to avoid completely parasites, indispensable condition for the reception of a clear, distinct and exact teleelectrocardiographic message.

Besides, it is essential that these apparatuses be in direct and continual connection, on one hand, with the physician who is at the patient's bedside, and on the other hand, with the physician receiving the teleelectrocardiographic message.

The teleelectrocardiograph consists of three principal apparatuses:

1. - **Apparatus A.** It is the broadcasting apparatus, close to the patient and broadcasting the electrocardiogram.
2. - **Apparatus B.** It is the receiver placed at the reception post of the electrocardiogram.
3. - **Apparatus C.** It is the electrocardiograph, connected with apparatus B and recording the electrocardiographic message received by the latter.

These 3 apparatuses work with town electrical current. It is also possible to build such apparatuses with accumulators or even with dry accumulators. In this case, however, it would be impossible to avoid the disadvantages occurring with the latter and besides, the transport is difficult and the cost of dry accumulators—if such must be used—is rather great.

General disposition

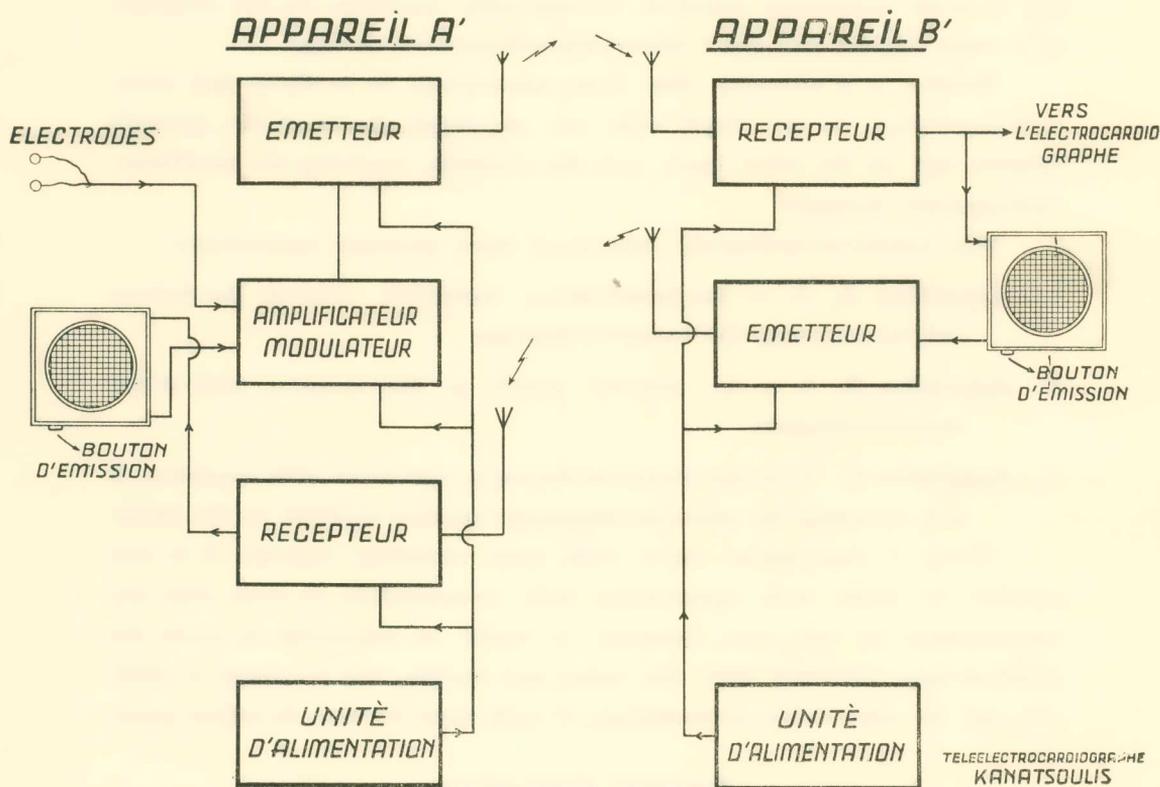
1. - Apparatus A consists of:

- a) *A. Broadcasting post*, working on the frequency of 48 Mc or 6m 25 wave rate.

* **A. ΚΑΝΑΤΣΟΥΛΗΣ:** Ἐπίδειξις λήψεως ἠλεκτροκαρδιογραφημάτων ἐκ μεγάλων ἀποστάσεων.

¹ Μετὰ σχετικὴν εἰσήγησιν ὑπὸ τοῦ κ. Σπ. Δοντᾶ περὶ τοῦ θέματος τῆς ἀνακοινώσεως ὁ ἀνακοινῶν ἰατρός κ. Ἄ. Κανατσούλης προέβη εἰς ἐκτέλεσιν πειραμάτων λήψεως ἠλεκτροκαρδιογραφημάτων ἐκ μεγάλης ἀποστάσεως.

- b) *An Amplifier modulator*, which will amplify, on one hand the cardiac current derived from the electrodes and, on the other hand, the treating Doctor's voice transmitted to the consulted physician.
- c) *A Receiver*, receiving the messages sent off by the Doctor of apparatus B to the Doctor who is near the sick person.
- d) *A broadcasting and reception Antenna*.
- e) *A supplying Unit*, which supplies the above apparatuses with the proper tensions.



2. - Apparatus B consists of:

- a) *A Receiver*, working at the frequency of 48 Mc and receiving the signals broadcasted by the broadcasting post of apparatus A.
- b) *A Broadcasting post*, broadcasting the messages of the Doctor of apparatus B, that is to say, of the consulted Doctor to the treating Doctor, which messages are received by the receiver of apparatus A.
- c) *A Broadcasting and Reception Antenna*.

d) *A Supplying Unit*, supplying these apparatuses with the required tensions.

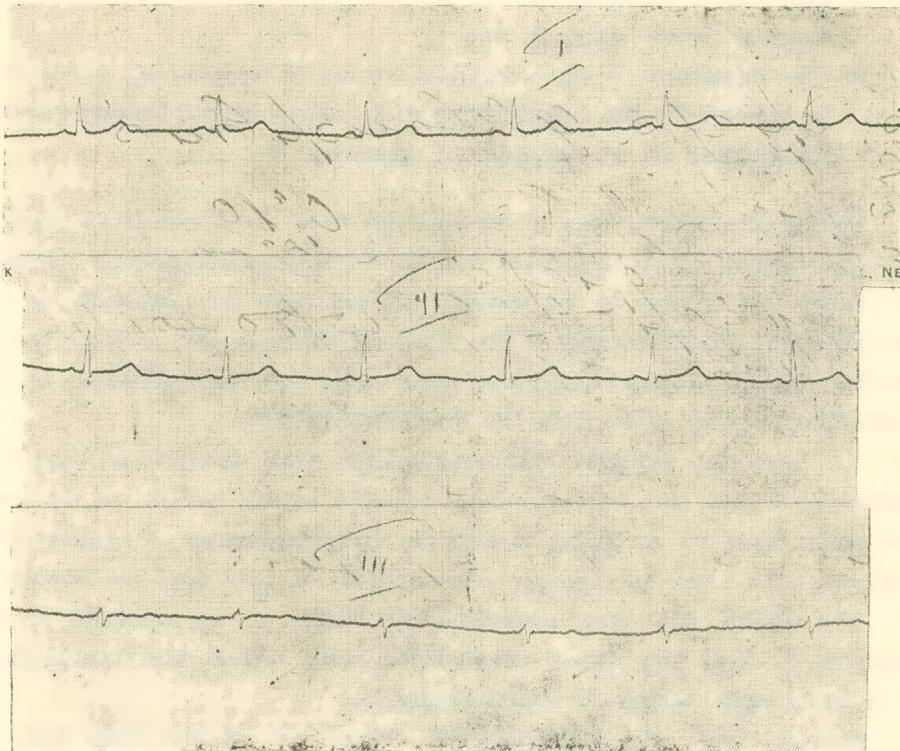
We are now building a new type of teleelectrocardiograph which consists of only two principal apparatuses:

Apparatus A which will be the broadcasting post, broadcasting the electrocardiogram and apparatus B which will be the Receiver as well as the Inscibar.

The here below diagram gives a general idea of this apparatus:

General characteristics and handling

The different parts of these apparatuses which play an active rôle in



The teléelectrocardiogram taken at the Academy of Athens.

the broadcasting and the reception of the electrocardiographic message, are naturally the broadcasting post and the amplifier of Apparatus A and the receiver of apparatus B. For this reason, their circuits have been calculated

without the least concession which could harm the stability, the precision or the reproduction of the electrocardiographic message.

The broadcasting post and the receiver must work with an absolute stability of frequency: the latter is determined by special quartz crystals. This disposition spares the obligation for the manipulators to tune the synchronisation, which would have caused a slight deviation.

Frequency has been chosen big for the reason that in this region, the disturbance occasioned by the parasites of the atmosphere is negligible. In other respects, at this frequency, a short antenna is largely sufficient for the efficacious radiation of the potential of the broadcasting apparatus A.

For the standardisation, two control manipulations are required:

- a) The control manipulation as for the adjustment of the electrocardiograph before using it, and
- b) The adjustment of the sensibility switch of the receiver, which will be effected by the broadcasting of a special signal of adjustment at the opening of the amplifier of apparatus A.

During the broadcasting of the message from the broadcasting post A and the reception by the apparatus B of the teleelectrocardiographic message, the Doctor who is close to the cardiograph will have the possibility to discuss about the good recording of the teleelectrocardiographic message and to stop the recording when a sufficient meter band has been obtained. In the meanwhile, he must press upon the broadcasting knob.

We have thus obtained electrocardiograms from distance, as clear and distinct as if they had been obtained with the patient present in the Doctor's study. Now we are going to take an electrocardiogram of a patient who is staying in a house of Athens a few hundreds of yards from the Academy.

The patient has been connected by means of the electrodes to the apparatus A. Near him stands his physician ready to take the message from us so as to begin taking the electrocardiogram.

Now we have all the derivations and we will let him know that we are satisfied and that we are going to close the connection. Here is the teleelectrocardiogram from long distance. I wish you all to see it.

Our broadcasting apparatus is of small intensity as we needed it for demonstration only and naturally we can't obtain a very long distance New York for instance. But now that I proved that distance is no longer an

impediment and that every man suffering from heart disease can call and consult a specialist of his own, now I say this apparatus needs to be undertaken by a big society so as to accomplish its predestination, in a word, construction on a big scale, with strong broadcasting apparatus able to take and send messages all over the world.

Π Ε Ρ Ι Λ Η Ψ Ξ

Διὰ τοῦ νέου τούτου μηχανήματος τοῦ τηλεηλεκτροκαρδιογράφου ἐξουδετεροῦται ἡ ἀπόστασις καὶ ἐπιτυγχάνεται ἡ λήψις ἡλεκτροκαρδιογραφήματων ἀσθενῶν εὐρισκομένων εἰς μακρὰν ἀπόστασιν ἀπὸ τοῦ ἱατροῦ.

Ὁ τηλεηλεκτροκαρδιογράφος οὗτος ἀποτελεῖται ἀπὸ τρεῖς κυρίως συσκευάς: 1) Συσκευὴν Α ἡ ὁποία εὐρίσκεται πλησίον τοῦ ἀσθενοῦς καὶ ἐκπέμπει τὸ ἡλεκτροκαρδιογράφημα. 2) Συσκευὴν Β ἡ ὁποία εὐρίσκεται εἰς τὸν τόπον λήψεως τοῦ ἡλεκτροκαρδιογραφήματος καὶ 3) Κοινὸν ἡλεκτροκαρδιογράφον ἐργαζόμενον ἐν συνδυασμῷ μετὰ τῆς συσκευῆς Β' καὶ καταγράφοντα τὸ ὑπ' αὐτῆς λαμβανόμενον ἡλεκτροκαρδιογράφημα.

Ἡ συσκευὴ Α ἀποτελεῖται α') ἀπὸ πομπὸν λειτουργοῦντα εἰς τὴν συχνότητα 48 μεγακύκλων ἢ εἰς μῆκος κύματος 6,25 μέτρων, β') ἀπὸ ἐνισχυτὴν διαμορφωτὴν, ὁ ὁποῖος ἐνισχύει τὴν τάσιν, ἡ ὁποία ἀπάγεται ἐκάστοτε διὰ τῶν ἡλεκτροδίων ἀπὸ τὸν ἀσθενῆ ἢ τὴν ὀμιλίαν τοῦ πλησίον τοῦ πάσχοντος ἱατροῦ πρὸς τὸν εἰς τὴν συσκευὴν Β εὐρισκόμενον ἱατρὸν καὶ διαμορφώνει τὸν πομπόν, γ') δέκτην λαμβάνοντα τὰ ὑπὸ τῆς συσκευῆς Β πεμπόμενα μηνύματα τοῦ παρ' αὐτὴν εὐρισκομένου ἱατροῦ πρὸς τὸν πλησίον τοῦ ἀσθενοῦς ἱατρὸν, δ') κεραίαν ἐκπομπῆς καὶ λήψεως, ε') μονάδα τροφοδοτήσεως τροφοδοτοῦσαν τὰς ἀνωτέρω συσκευάς διὰ τῶν καταλλήλων τάσεων.

Ἡ δευτέρα συσκευὴ ἀποτελεῖται καὶ αὐτὴ ἀπὸ δέκτην λειτουργοῦντα εἰς τὴν συχνότητα 48 μεγακύκλων καὶ δεχόμενον τὰ σήματα τοῦ πομποῦ τῆς συσκευῆς Α, πομπόν, κεραίαν ἐκπομπῆς καὶ λήψεως καὶ μονάδα τροφοδοτήσεως.